PENNSYLVANIA

Game News

JULY 1954 10 CENTS

THE STORY BEHIND THE COVER

TO men of all ages and many nations, the eagle has been a symbol of victory, power, and freedom. And to anyone who has seen this "king of the birds" soaring in the heavens, diving like a meteor from the skies, screaming defiance at the storm, or fiercely striking his prey, it is easy to understand why.

The choice of the American, or "bald," eagle as our national emblem was no easy matter. Six congressional committees worked many years selecting a bird to represent their new nation before the eagle was finally adopted on June 20, 1782. From that day on, the effigy of the American eagle, with wings and feet extended, became the official badge of sovereignty of the United States. On our coat of arms, our Great Seal, the President's flag and seal, and on many of our coins and decorations, the eagle is proudly represented.

In structure and habits, the eagle is a large hawk—the most powerful raptor of them all. The female, usually larger than the male, may attain a length of 43 inches, a wingspread of eight feet, and weigh 8 to 12 pounds. Eagles are capable of lifting their own weight and have been known to carry off lambs and deer fawns. Yet this great bird is content to subsist largely upon fish, often robbing the osprey of its catch by forcing the smaller bird to drop its prey in mid-air.

Eagles mate for life although they re-mate if death dissolves the partnership. They are the greatest home-builders in their class, returning to the same nest and adding to it year after year. One nest in Ohio was used for 35 successive years, reaching a size of 12 feet high and 8½ feet across the top and a weight of almost two tons. Two, rarely three, eggs are laid in March, the eaglets hatching in mid-April. Pennsylvania boasts the only eagle sanctuary in the world. It is located at Mt. Johnson Island, in the Susquehanna River near Lancaster. Regrettably, no eagles have nested here since 1948—the noble birds having either died from natural causes or been killed by human law violators. The national bird is given complete Federal and state protection in this country.

Symbol of our freedom and liberty, the American eagle represents this nation's power and glory. Through protection against wanton shooting and the saving of its rapidly vanishing nest sites, this noble bird can long remain an inspiration to all.

PENNSYLVANIA Game News

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Editorial . . .

Spirit of Independence

AMID the fireworks and flag-waving, the parades and popcorn, it is often easy to overlook one basic message of Independence Day. That "these united colonies are, and of right ought to be, free and independent states" is a long accepted and well defended fact. But in a world that has increased its tempo to the speed of a jet, that has narrowed its boundaries with super highways, and has conquered its last remaining unknown areas, the frontiers that faced our American pioneers in 1776 has vanished forever.

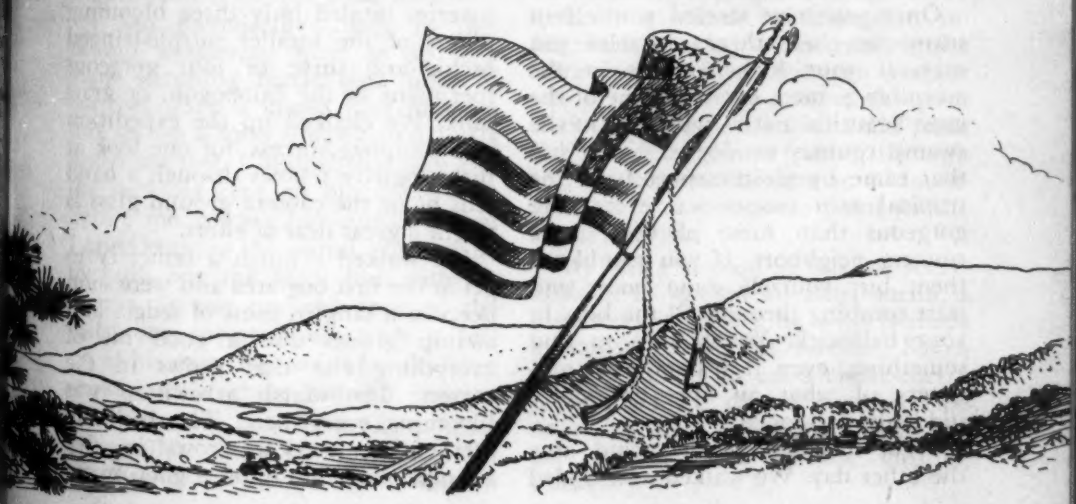
To a degree, we are as independent today as were our forefathers 178 years ago. Our way of life is still based on the same principle that motivated the original noble and courageous Declaration. Yet our very independence today depends on even greater united action to insure the greatest good for the greatest number—the right to life, liberty, and pursuit of happiness.

In no other field of human activity is such action more important to America's destiny than in the use of natural resources. How well and how wisely we plant our farms, harvest the timber from our templed hills, use and preserve clean waters in the rivers and rills—how well we do these things may determine the future of an entire world. *Conservation can't wait!*

Ours is a land of opportunity, the home of the free. As one nation with liberty and justice for all, we hold the hope of the hungry, the sick, the weary in every land. If we are to continue producing the food, fuel, and forgings that will sustain us and our neighbors, all that lies from sea to shining sea must be conserved and used wisely. *There is nothing left to waste!*

July Fourth this year should, and can, rekindle the spirit of '76—the spirit of equality for all, the will-power to face the future with great expectations, the courage of our conservation convictions. All these can confirm our basic dependence on our God-given natural resources and, at the same time, preserve our national independence.

Democracy is safe in the hands of a conservation-conscious people!



Outdoor Reveries

Good Old Summertime

By John H. Day

IF YOU want to find an orchid, you've got to make up your mind to three things. First—you're going to get your feet good and wet, and if you aren't careful it won't be only your feet. Second—you'll almost certainly have to breach a rampart of the treacherous poison sumac to arrive at the elusive quarry. Third—after you've been lucky enough to find a few of these rare blossoms, you've still got to plough your way back out of the swamp to your car.

Once you have steeled yourself to surmount these three obstacles you may, if your lucky star is in the ascendancy, meet up with some of the most beautiful native wildlings in the swamp country catalogue. No orchid that came by air transport from the tropical rain forests was ever more gorgeous than some of these back country neighbors. If you would see them buy yourself some boots and start combing through all the bogs in your bailiwick. You're sure to find something, even if it's only the discovery of what an appetite you've suddenly developed.

I got involved in an orchid orgy the other day. We walked and waded and splattered around through three swampy fastnesses and after a full day of gruelling work, our combined discoveries totaled only three blooming plants of the smaller purple-fringed orchis and three or four gorgeous specimens of the calopogon, or grass pink. We chalked up the expedition as a complete success, for one look at these fugitive fellows through a hand lens or in the camera ground glass is worth a great deal of effort.

We walked through a cemetery to get at the first bog area and were soon deep in a tangled mass of sedges and swamp grasses and a good bit of everything else that grows in the region. The marsh arrowhead was blooming everywhere. The little insect-snaring sundew grows in this swamp. We came upon a good many

of these carnivorous fellows, some in full flower. The glistening mucilaginous drops on the leaf tentacles attract insects to their doom. We saw one leaf which had snared a hapless softbodied bug. In another day or so Mr. Bug will be absorbed and the leaf ready for the next ill-fated "customer."

The outdoorsman has a slightly uneasy feeling when he finds himself treading the surface of a "quaking" bog which is actually quaking. It's almost the same sensation as walking around on a bed. In one spot one of my half boots got mired and didn't want to come out of the oozing muck. I leaned on my walking stick for support. The cane started on down to China and I very nearly "leaned" flat on my face before I managed to flounder out of that tricky spot.

One or two grass pinks and a single purple fringed orchis were the score for this swamp. I walked right past the grass pinks and never saw them. Another member of the gang, coming by a half hour later, spotted them immediately. We drove a half dozen miles and struck into another swamp. Here the wading was worse and there were no orchids, but a magnificent station of Turk's-cap lilies lorded it over a wide area.

I was floundering about in this swamp wondering what to do if a giant snapping turtle took hold of my toes when a marsh bird of some sort set up a loud squawk practically under my feet. I headed that way and the cackling kept on but a few feet before me, always just out of reach. I tried rushing the sound in an effort to flush out the bird, but with no success. It was probably one of the rails, our shyest birds, with a full set of his own road maps for skulking around amid those bulrush jungles.

The swamp candles held up their erect yellow clusters of bloom to light up this marsh. In the open water a

colony of spatterdocks displayed the unimposing yellow "water lily" flowers. I saw a few sundrops open to the sun and several plants of the steeple bush. False sunflower was much in evidence in the thickets where the footing was more solid.

The last bog of the day was the most extensive of the three. Loose stones of the glacial moraine were all about the upper limits, giving some hints as to the origin and character of this marsh. Here was where the poison sumac grew in sizeable thickets, hiding its sinister nature beneath a veneer of deceptive innocence. It is a symmetrical, quite attractive shrub, growing an average ten or twelve feet tall, with quite noticeable red leaf stalks. I did some fancy ducking while passing through this thicket, for this sumac is doubtless the most poisonous plant in the whole region.

My luck ran good in this last foray. Hidden in against an alder shrub, I discovered a grass pink with perhaps a half-dozen perfect blooms. Somebody dared me to eat a choke-cherry or two from a cluster hanging ripe near this spot. I did, and nearly lost my partial plate in the ensuing pucker.

Of all the nocturnal creatures who promenade across our midnight lawns the dull-witted 'possum is certainly the most unattractive. One of these long-nosed scavengers came foraging in a flood-lighted area one recent evening. Our collie made a dash at him and he folded promptly into the "deadest" and ugliest visitor of the summer. The raccoons hereabouts are roguishly handsome, and the skunks are real dandies, but the 'possum has been short-changed so far as personal glamor is concerned.

In the first place he looks too much like a rat. His nearly naked tail, tiny eyes and long flexible nose were not designed to win any beauty contests. Coon hunters despise him, while gentlemen of color catch him alive, fatten him on bread and yams and apples and roast him to a turn, declaring there is no tastier meat.

I'm always amazed at how dead a 'possum can look when working his ancient ruse. Our visitor lay on his side with his gums drawn back from his glistening white teeth. He looked like he might have been dead for a month. His fur had a sort of wind-blown appearance, as though it had been exposed to wind and weather for many weeks.

We called off the collie and awaited developments. In a few moments came the resurrection. I didn't see Gabriel nor did I hear his muted horn, but that lately defunct 'possum surely did. First he raised his head, sniffing for news. Then he got slowly and unconcernedly to his feet and moseyed off, as though it was all part of the night's work.

We sent the dog in again and br'er 'possum went right back into his act, dead as a dodo, and twice as ugly. Again came the all clear signal and he slowly breathed life into his sleeping limbs and took himself off into the surrounding darkness. So long as he stays out of my corn patch all will be serene.

My wife talked herself into coming along on a weekend ramble. She loaded sandwiches and a thermos of tea into the car and we set out for the hinterlands. The day was sticky and murky and humid, ever threatening showers which did not arrive until the very moment we planned picnic supper, when they forced us back into the car.

Shod in knee boots we spent an hour or so exploring the bed of a wide, lazy stream which has thrown its coils about the ankles of the timbered hills. A myriad crayfish scuttled backwards as we waded past, roiling up the bottom as they sought safety under stones and in the dim recesses of their "caves." Giant water spiders ran under the door stones at our approach.

There were many dragon flies and damsel flies hunting a living over the eddies. The white-tailed dragon fly and the big fellow called the green darner were flying everywhere. Great patches of water willow had homesteaded the shallow flats, and were already showing a few of the gorgeous blooms. Monkey-flower displayed its grinning blossoms on the moist banks.

As my wife pushed under some sycamore branches overhanging a quiet pool a watersnake suddenly dropped into the water before her. Right there she threatened loudly to quit the expedition, but I restored harmony by promising to go ahead and jar off any more snakes sleeping in the branches. A box turtle by the creekside cast a baleful red eye at us. He's supposed to loaf around in the woods, and not in creek beds.

We came out of the creek via a fishermen's path to the nearby roadway. The summer roadsides are already wearing a slatternly down-at-heels look. A heavy burden of dust lay over the poison ivy and dogbane and sycamore sprouts along the way. Wild bergamot had climbed the hill from the moist bottom edgings and had painted a wild pasture acreage with light-lavendar pastel beauty.

At our feet a milliped rustled along —a dry rasping creature in the arid roadway wastes which fairly panted for the refreshing shower even then just over the next hill.

There is no mistaking the fact that summer has arrived when the roadside chicory hangs its dew-kissed banners to delight the early morning motorist, or the strolling countryman abroad with the July dawning. It shows a decided preference for limestone soil, and once established, creates oases of misty blue beauty on unsightly dumps, vacant lots and down-at-heel thoroughfares. Only the early riser sees this azure glory in all its morning freshness, for the chicory knocks off at noon, closing the flower show for the day. Early to bed and early to rise is its motto.

Many folks are unknowingly quite well acquainted with the chicory, for its dried and ground root has long been used as an adulterant in coffee. The plant is an immigrant, and probably came to this country in the earthen ballast of the sailing brigs of pioneer days. Since arrival here it has rolled back frontiers with reckless abandon.

There is no other blue in the open quite like the hue of the chicory's "blue sailors" when in massed bloom, unless it be the sky above. Artists are fascinated by the color and struggle vainly to reproduce it on canvas. Poets have kept a warm spot for this "peasant posy." It's a leading performer in the early summer pageantry, and when once seen shimmering with blue radiance in early morning sunlight can never be forgotten.

Spurts of orange flame are flaring again in the old-field tangles, another sign of summer's arrival. The gorgeous butterfly weed has caught fire from the July sun and is smouldering suddenly across the countryside. Daring butterflies delight to play with this fire all day long, soothing the scorching they must receive with long cool draughts of refreshing nectar.

But perhaps the best tip-off that "summer is a-comin' in" stems from the loud-mouthed cicada who is once more beating his drums in the treetops. He's a born press agent, and his shrilling is very much a part of drowsy summer days. Some folks call him locust or harvest-man, but every-

BLACK AND WHITE WARBLER

one who gets outdoors in July knows this big, blundering, bulgy-eyed insect.

A weekend ramble down a shady July lane in the timber hills took us past verdant banks where the purple flowering raspberry was blooming and the American spikenard had established colonies of tremendous plants in the rich loam. A bobwhite paged himself at intervals from the edge of a neighboring grain field. High overhead a pair of buzzards rode the updrafts with effortless ease.

We sprawled at ease beside a hidden spring and watched a groundhog eye us warily from the safe depths of the entrance-way to his burrow. A hummingbird worked over the pendant flowers in a clump of jewel weed near by. A black and white warbler, first I had seen this year, flew in to work over the trees just opposite. This little fellow creeps around trunks and limbs with all the assurance and nonchalance of a nuthatch.

Basswood was nearing the end of its flowering, but the honeybees refused to believe that the show was over. We didn't have to look up to know when we were passing another linden tree. The busy bees set up such a happy murmuring that each basswood sounded like a miniature factory there in the shady forest aisles. My friend the old "sang" hunter stoutly maintains that linden honey is the "best they is."

We spread picnic supper beneath a wide oak far back from the roadway. Ants and a wasp or two and some stray flies moved in to share the repast. Dinner music was by courtesy of the local chewink choral society. The site was air conditioned, the breeze even throwing in the fragrance from a fresh-cut hayfield near by. Amid all this luxury I munched lazily on a sandwich and pondered the sanity of the hurried folk knocking themselves out on holiday highways across the land.

. . . *The End*

State's Largest Furbearer Was Here In Dim Past

The beaver was abundant over the waters of this part of the country when the first white trappers came to take its valuable pelt. However, these hydraulic engineers became extinct as a wild fur species of this state about the middle of the last century.

The Game Commission purchased and released 100 beavers between 1918 and 1925. Given protection until 1934, these large, water-going rodents have since provided an excellent fur harvest annually in the state, except for 1953 when there was no open season on them.

Recently, Floyd C. Meade, of Moscow, Lackawanna County, provided proof, these, our largest furbearers, were here "away back when." He produced a sample of peat taken from the Moscow area under eight feet of which were found beaver chips and cuttings.

Geologists suggest these bits of evidence could be from 10,000 to 30,000 years old, indicating how long the forebears of present-day beavers have been native to the area now known as Pennsylvania.

Meet Mister Monax—

Pennsylvania's Biggest Little Game Animal

Fish & Wildlife Service Photo

By Ed Shearer

IN THE minds of many Mr. Monax (alias woodchuck, groundhog or whistle pig) is rapidly going to the top of the list of live targets for the rifle. His followers number in the thousands and no more enthusiastic sportsmen can be found anywhere in Penn's woods or fields.

As a prophet of seasons, Monax has no peer. Upon his appointed day each February, thousands of people await his decision as to whether spring will soon be here. But whether you are one of the faithful or one of the skeptics, there is one thing you can rely on. When the woodchuck forsakes his winter den and establishes his spring and summer quarters, the world takes on new life. It is the time of glorious warm spring days, buds bursting their petals, and the newly arrived birds choosing their mates and making homes. The outdoors fires your blood—it is the time of the fly rod and the scope-sighted precision rifle.

Little realized by the general run of shooters is the stellar role Mr. Monax has played in the development of modern long range accuracy. From the days of Dr. Mann, Leopold, Adolph Niedner and Harry Pope down to the present time, the driving passion among varmint enthusiasts has been to produce a rifle and cartridge that would knock the eye out of a chuck at three or four hundred yards. The tremendous revival of bench rest shooting is due in large part to the thirst of chuck hunters for

more accuracy and speed at longer ranges.

From an economic standpoint the woodchuck is assuming impressive proportions as a monetary asset. Countless dollars are being spent annually by chuck hunters to the benefit of Pennsylvania businessmen. Several thousand target shooters buy hunting licenses to hunt for chucks only.

Even in national defense this remarkable little marmot makes his importance felt. The Korean war taught us that the price of not being able to stalk and shoot is needless waste of American blood. It's a lesson we have had to learn all over again in every war, yet they say Yankees are smart. General Merrit A. Edson, commander of the famed Marine Raiders, claims, "The most deadly combination in combat is a good rifle in the hands of a good stalker who can shoot it." As an instructor in this stalking –shooting game, Mr. Monax is tops.

On the debit side it is admitted that the woodchuck does a certain amount of damage on the farm. Under certain conditions, some control is necessary. But on the other hand, deer, bears and other game animals hand out the same amount of grief in this department and there is no more reason for wiping out one species than another. In short, it's about time we stop calling Mr. Monax a varmint and recognize him for what he is–a great little game animal.

There are seven subspecies of woodchucks but the particular chuck we deal with in Pennsylvania is the southern woodchuck. Hibernation here usually starts in October or November, depending on the weather. In common with other "sleepers" the body functions of the chuck are reduced to a very low level, the heart beat slowing down and respiration dropping to a point that just sustains life. No food passes into or out of the body during this period which may last from two to six months depending on the climate and advance of spring. When temperatures rise and need for food demands, Mr. Chuck bestirs himself. He emerges from his winter den with a ravenous appetite. At this time caution is at low ebb and he is easy picking for the man with a gun. Soon the female has her family which may number from two to five. When these little chucks come above ground, they will weigh from a half to a pound and a half, are quite helpless, and if the mother is killed, will slowly starve to death.

In shape a woodchuck resembles a mammoth squirrel. He has a heavy set body with a short, broad head. The brain cavity is small and well protected by the skull. The brain pan is little longer than wide, a small target of about one and a half inches on large chucks. Southern woodchucks average about seven pounds in weight under good conditions but some individuals may come double that weight.

The woodchuck is a realist in selection of his home sites. The winter quarters are made in a deep den on a hillside facing east or southeast where the sun warms it in the morning and the hill shelters it from the cold north wind. The temperature in woodchuck winter dens remains almost a constant 32 degrees.

In spring and summer, Mr. Monax moves his home right into his restaurant. Right out in a clover field, the edge of a pasture, he loafs, eats and sleeps near his burrow, taking on fat for the winter snooze and ready at all times to make a swift escape from his enemies. The southern chuck is sought by many pursuers, other than man–the foxes, large hawks, owls and dogs. It takes a husky dog, however, to handle a full grown chuck. But in spite of his array of enemies, Mr. Monax has held his own.

There are several methods of hunting this wily little marmot. Probably the most popular system involves

Hal Harrison Photo

Chuck hunters don't hit them all.

watching a field that has been prospected—the dens and ranges previously located. The second consists of roaming over the country in search of chucks, then stalking them within range after they are spotted. A third method which is attracting a large number of hunters each year centers about cruising back country roads by car until a chuck is sighted, then leaving the vehicle parked safely while the hunter dismounts and assumes the proper shooting position.

The first method of watching a clover field, pasture or other piece of country is a favorite practice of the farm boy and the real chuck expert alike. Both types of hunters have one thing in common. They know the chucks are there. They waste no time in searching barren country and they usually have their country prospected well ahead of time. Many times they will even go so far as to map the location of dens and select firing points from the standpoint of visibility, background security, and comfortable, safe firing positions. They should be careful to select these positions so that their heads are not skylined, thus reducing the hazard of having some tyro or numbskull hunter from mistaking them for a chuck.

There is another thing an old-hand invariably does on a set-up of this

Hal Harrison Photo

This is how it's done—sometimes. As the groundhog (left circle) sticks its head out of the burrow, the waiting hunter (right circle) is all set for the shot. If he misses, there will be no second chance.

kind. He paces the distances from his firing point to the dens and marks these ranges down in his notebook. This type shooter will generally have a high percentage of kills per shots fired and will make some very long range kills. He knows his range on any shot offered and consequently has only the wind problem to solve.

This type hunting is made for the man who enjoys the beauty and quiet of the countryside. He enjoys the sunlight of early morning and receives the dividends of glorious sunsets. He sees nature in her softest mood. If there be poetry in hunting, this is it.

The second method of chuck hunting involves moving carefully over the terrain, trying to see the woodchuck before he sees you and then maneuvering into position for a shot. This is the true stalking method and is by far most used by the man who aspires to a degree of skill approaching perfection. The intelligent stalker soon realizes that the kill is of secondary importance. It is the developing and testing of his skill in outwitting game that is the real goal.

To be a successful, stalker, you must develop an ability to see game in its natural surroundings. You must also recognize different kinds of cover and be able to take advantage of them. Generally, cover can be classified in two types. One is made up of solid objects like stone walls, trees, stumps, and mounds which conceal you completely from an animal's sight. The other type of cover merely breaks your outline and screens your movements by shadows, intermittent lines or colors. This cover may be grass, leaves, brush, or other things which give the quarry only fleeting glimpses of your body outline. It takes both skill and practice to use this kind of cover successfully. In effect, you must be able to blend with your background, to confuse the eye by camouflaging your normal appearance.

Movement is of great importance. Birds and animals do not see colors as man does but they pick up movement very quickly. Their lives depend on their ability to discern motion in their surroundings and to do some-

thing about it fast. Animals, from a buck sneaking around you in the brush to a cat after a bird on the lawn, go slow in cover and fast across open places. There is no doubt that stalking woodchucks is an art, a skill not learned by everyone. It takes an ability to read and understand terrain, stealth to move through it unobtrusively, eyesight that can see every little detail, and marksmanship to hit what you see.

The third method, one that is gaining in popularity, consists of cruising the back roads in "chuck-land," scanning the countryside until a chuck is sighted. It is a good method to use in strange country because you can cover a lot of ground while your car does all the work. You stop at every likely looking vantage point and thoroughly cover the surrounding terrain with as good a pair of binoculars as you can afford. You can relax, watch the changing scenery, and converse to your heart's content. When Mr. Monax appears, you dismount from the car and do your shooting from a safe position nearby. It's illegal, of course, to shoot from the car —and for good reason.

This type shooting is apt to involve rather long ranges, particularly if the chucks have been much shot at. My notebook tends to indicate that under these conditions range averages close to 250 yards, which calls for a very accurate, flat shooting rifle plus a good scope with fine cross-hairs. On the other hand, you usually have time to pick a good shooting position, discuss the wind, and your pal can spot your shots for you. You are far enough away so that the chuck is not too nervous.

When it comes to the best rifles for chuck hunting, any writer is treading on dangerous ground in recommending models or types. There are many in the varmint clan who strongly contend that in order to kill a chuck at over 100 yards, you must have a rifle built by a celebrated custom rifle maker. They say your rifle must be chambered for a cartridge whose virtues are manifold and faults are non-existent. They speak of the beauty of the wood grain, the graceful lines, and superb accuracy of this rifle.

Belonging to the "John Doe, Richard Roe" class myself and being a graduate of the hard-boiled school of small bore shooters, my aesthetic senses are sadly under-developed. To me the finest and most beautiful chuck rifle is one that keeps its groups closer than an old-time family and one that doesn't put a mortgage on the homestead. And since I write for the average shooter and the beginner, some two years ago I began experimenting with some of our best factory rifles bought across the counter. The record shows that to date, the Model 70 Winchester in the 220 Swift, 250 Savage and 257 Roberts together with the Remington 722 rifle in the 222 and 257 calibers will shoot right along with the custom rifles of the better makers from a pure accuracy standpoint.

It has been my experience with run of the mill factory ammunition that you run out of size at about 200 yards although some lots will do better. From here on it's a handloading proposition if you want those small groups. A real chuck rifle must stay within one minute of angle (or one inch per hundred yards) to qualify. Furthermore, the scope must be of sufficient quality to enable you to see better than your rifle will group. This is one of the real secrets of small groups.

Don't expect to buy a 220 Swift and a box of cartridges across the counter or put ordinary handloads in your rifle, then hit chucks at 300 yards. The rifle just won't do it nor will the custom rifle, either. That kind of accuracy comes from fitting a load to your particular rifle, carefully selecting the components, skillfully assembling them in the cartridge

case, and finding out which combination your rifle shoots best. This is most important for without such care and testing, neither your factory rifle nor a custom rifle will be worth a "hoot up a dark hollow" on chucks out further than about 250 yards.

So to the budding chuck hunter with a yen for far shots there are two choices. You can buy yourself a set of good reloading equipment, books, and tools, then learn through trial and error how to load "tack hole" ammunition. Or you can talk some custom handloader into developing a load for your rifle.

A four power hunting scope with medium cross-hairs is effective on crows to 200 yards and chucks to around 225 yards. With a good grade scope you can see the game but your cross-hairs may cover the target so that you don't know quite where you are holding. The average medium sized cross-hairs cover about 1½ inches per hundred yards. You will get some misses due to this difficulty but that is the price of a combination hunting and varmint scope.

A real varmint scope should have either cross-hairs or a dot that allow you to hold on the exact spot you expect to hit. This calls for one-half minute of angle cross-hairs or dot because in this size you can hold on chucks at 300 yards yet still see where you are holding.

For a very accurate rifle, a good six power scope with medium fine X-hairs or dot will give you good visibility at 300 yards under very good light conditions. But from about 250 yards on out the big scopes start to really come into their own. It also starts to cost you important money. The scope I have used most for this type shooting is a Unertle Ultra Varmint 12 power with a two inch objective lens in target mounts. It has medium fine X-hairs and enables me to pick

Groundhog hunters use a wide variety of rifles and ammunition. The "best" rifle is strictly a matter of personal choice.

Hal Harrison Photo

up chucks against bad backgrounds as far as I want to throw a cartridge. This type scope costs as much as a good rifle, of course, but they are a lifetime proposition. There are several of these scopes on the market, all very good, but the beginner won't need one for a long time.

There are some ideas I wish every chuck hunter would take afield with him and put into practice. The term "long range" is relative. A better term might be "the margin of your personal skill." Forget about the boasts of the other fellow who claims he can get them "way out yonder." Concentrate on developing your skill by practicing, then increasing the ranges as your shooting improves.

Regard the farmer as your host and strive to make him your friend. You do not endanger the families, destroy the property, damage the crops, or frighten the livestock of your friends. Your hope of a woodchuck haven lies with the farmer even as his opinion of all hunters rests squarely on your shoulders.

Last, but not least, look at your backgrounds before you shoot. Be sure it's a chuck before you pull the trigger. There is absolutely no excuse for shooting a man, or any other living thing, in mistake for a woodchuck. The only thing in this world that looks like a chuck is another chuck. Anything else is merely an unidentified object which should be studied and watched until you can definitely identify it by name. And in order to safeguard yourself and make it easy for others to identify you, wear a flourescent cap in bright red or yellow. Best color by test, however, is "fire orange." Finally, leave some seed stock in the chuck population for next year. Shoot all you want as long as you shoot safely and don't shoot all the chucks you see.

. . . *The End*

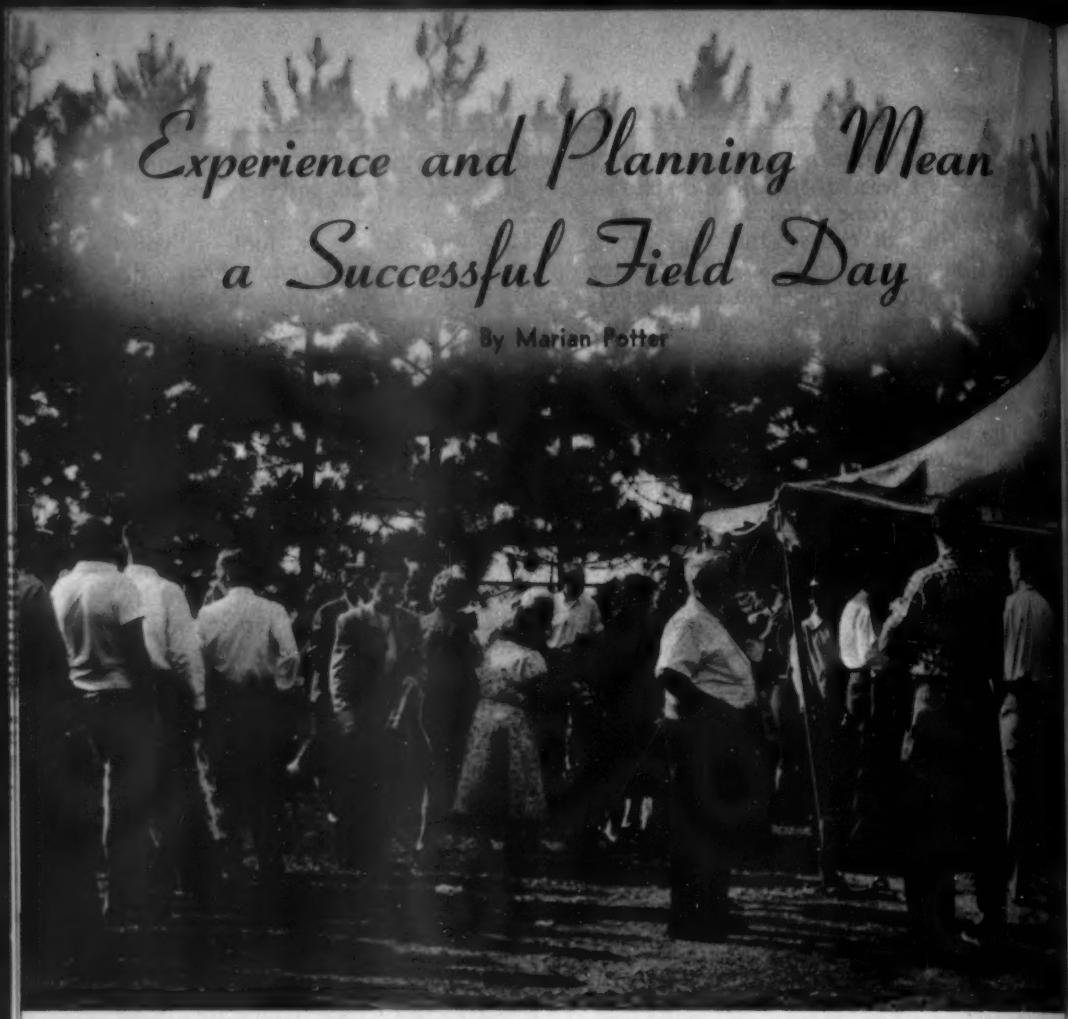
GAME CASES INCREASE IN PROPORTION TO HUNTER NUMBERS

Men experienced in wildlife matters often remark that the true sportsmen of the outdoors far outnumber the game law violators. These observers are agreed, however, that so long as men hunt wild birds and animals the need for vigilant game law enforcement will continue, human nature being what it is. The ensuing history bears this out and appears to indicate violations occur in numbers proportionate to gunning and trapping pressures exerted on wildlife.

On May 26, 1924, a prosecution numbering system was instituted by the Game Commission. Case No. 1 under the new system came from Clearfield County. It involved a man whose dog chased game in close season. On January 2, 1954—nearly 30 years later—game law prosecution No. 100,000 was filed at Harrisburg. The violator in this case was apprehended in Montgomery County. The charge was "Assisting in the concealment of an illegally killed deer."

In the first fiscal year of the system (1924-25) there were 2,200 game law prosecutions brought. Penalties collected totaled almost $42,150. In the Commission's last fiscal year, ending May 31, 1953, there were 5,041 such prosecutions. The fines for that year aggregated $161,735. Here is evidence that Pennsylvania's corps of game protectors kept pace with developments.

In 1953, the record shows that 61% of the apprehensions were made in November and December, in the so-called "game season months." Strikingly, nearly two-fifths of the cases were spread over the remainder of the year. In the last calendar year about 98% of Pennsylvania's game law cases were successfully prosecuted.



Experience and Planning Mean a Successful Field Day

By Marian Potter

Warren Field and Stream Club Emphasizes Sportsmanship and Conservation

ONE of the final outings of the summer for many families in the Warren area is Field Day which the Warren Field and Stream Club has conducted for the past nine years at Irvine, Pennsylvania. Wilder Field, the recreational tract of the National Forge and Ordnance Company, is a beautiful setting for the event which has attracted as high as 10,000 people in a single day. The hill-surrounded field enclosed by a border of pines has ample space for setting up the marksmanship ranges, conservation exhibits, lunch stands, bleachers and pony rides that mean fun for the whole family.

Net returns to the organization from Field Day have ranged from $1000 to $1800 annually, and this money is used to advance the club's projects which have included: fish stocking, aid in establishing Chapman State Park, founding Spring Creek Fishing Paradise, providing wildlife food and cover stock, seed distribution, tree planting, scholarships for conservation students and transportation for the field trips of the Warren High School conservation class.

Plans for Field Day begin in January when a general chairman and about fifty sub-chairmen are selected from the club's membership of about

1800 men. Duties of sub-chairmen are specific, and each stand, exhibit, game, or service at the field runs with the smoothness that comes from experience and careful planning.

The general chairman begins early in his efforts to book a special entertainment feature in keeping with the theme of the day. Some of these have been the Heather Highlanders of Youngstown, Ohio, a band of girl pipers; the champion chopper and axe-thrower of New York State; exhibition of rifle, pistol and shot-gun shooting by experts from armament firms; plug and fly-casting experts; FBI marksmen; and dogs trained for police work by the Pennsylvania State Police. At the most recent Field Day, a group of local young people were featured in an exhibition square dance. This country dancing was enjoyed especially by the older people, even though one elderly man as he hobbled away on rheumatic legs at the close of the show declared that he could still "out-dance 'em."

Tents to house all the stands and exhibits are rented from a neighboring fair association. One of the most popular stands is the Fox Hole Inn which served 2500 hamburgers and hot dogs and barrels of coffee at the most recent Field Day. Under the direction of Frank Reese of Warren and his 16 assistants, stoves, coffee makers and soft drink coolers are set up in the big tent, and onion chopping begins early in the morning of Field Day. Stoves which burn bottle gas belong to the Field and Stream Club and were custom-made in Warren plants. When not in use, they are dismantled and stored in the club's warehouse along with the steel soft-drink coolers which were also fabricated in Warren plants. The club has a complete supply of field cooking utensils.

Games which are set up in tents in mid-way formation were designed by club members and made by them. One of the most popular ones with children has been a dart game with a board of large dots as targets. Children throw until they win. Not infrequently a patient attendant guides a small hand within a few inches of a target.

Attendants also help at the marksmanship ranges where youths are sometimes handling a rifle or pistol for the first time. Although firearms manufacturers and fishing equipment makers do not have commercial exhibits of their products at the field, experts in the use of this equipment are usually present to demonstrate its proper use.

The club carries liability insurance on spectators but none on its own members assisting with Field Day. So far, the only casualties to attendants have been cases of poison ivy suffered by two whose duty it was to adjust and inspect rifle targets back beyond the mowed area of the field.

An effort is made each year to vary target ranges with some novelty. Moving targets such as a balloon slowly propelled by a small motor have been well liked. This past year bowmen tested their skill on a large target shaped like a chicken and were awarded live chickens for prize shots while riflemen aiming at a life-size

A young archer tries his skill at the Warren Field and Stream Field Day.
Photo by the Author

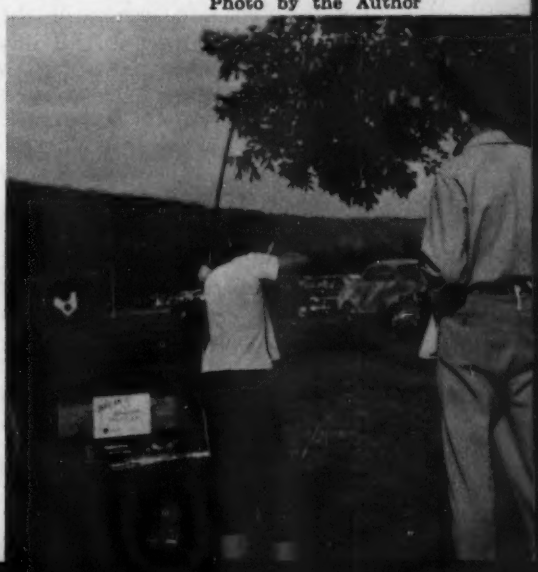


Photo by the Author

The rifle range is always a center of interest.

deer target hoped to explode a dynamite cap concealed behind a vital part of the body and thus receive an extra award. Anglers strove to place plugs and flies inside automobile casings placed on the ground or through those hung above the ground.

Donald Taft, an employee of the U. S. Forest Service, who has been general chairman of Field Day for the past four years is aware of the educational possibilities of the day and has stressed good conservation exhibits. The Forest Service and Pennsylvania Department of Forests and Waters prepare exhibits and use the opportunity at the beginning of the fall fire season to demonstrate the need for care against fire in the woodlands. The Game Commission has a token exhibit of wildlife while the U. S. Fish and Wildlife Service has on hand a fish tank truck of live trout from its fish hatchery at Farnsworth. The Valley View Mink Farm of Chandlers Valley often displays its furbearers. Last year local sportsmen brought in a number of live rattlesnakes, one of which very considerately gave birth to a number of young the morning of Field Day, thus adding an extra attraction.

Students of the Warren High School whose course in conservation was originated by the Field and Stream Club have an opportunity to assist their sponsors by helping to direct parking at Wilder Field. Between $2000 and $2500 are required to put on Field Day. Expenses include such things as a day's rental of a dozen Shetland ponies from a nearby amusement park to give free pony rides to children.

The Warren club has been fortunate in never having had a wet day for their big event. Most Field Days have come on those beautiful Indian summer days that give Pennsylvanians a chance to boast about their climate as well as their sportsmen. . . . *The End*

The Road to Conservation

Terracing—Past and Present

By Ivan McKeever

SHOULD you attempt to see terraces and the remains of terraces that have been built throughout the ages you would have a long and interesting trip. In order to see some of the best examples of ancient terrace construction you would travel to some of the most remote lands of the world. You would want to visit the inaccessable mountains of Luzon and inspect the Ifugao rich terraces of the Philippines. These stone wall terraces are the highest, best built and most extensive in the world. They cover 250 square miles and are an admirable engineering feat. Placed end to end they would probably reach half way round the world.

In traveling to learn of the ancient terraces you would not want to miss, if conditions permitted, a trip to the mountain fastnesses of the Yangtse Valley where the aboriginal inhabitants were driven by the Mongol conquerors untold centuries ago. It was here, at about 10,000 feet above sea level, that the Tze or "untamable worms" as they were called by the Mongols, perched their villages on the steep cliffs. In order to survive under such conditions it was necessary that they use every available bit of soil. Perhaps here the most spectacular terraces ever constructed were built on the steep mountainsides. Sometimes terraces were so inaccessable that it was necessary to reach them by means of a rope.

Other examples of terraces, as they were used in Asia and Europe, served to convince us that most early people recognized the importance of terraces to prevent erosion. Terracing was practiced around the Mediterranean Sea and in Britain during the Bronze Age. In Japan terracing became a common practice a long time ago. When the Arabs reached Spain in the 10th Century, they covered many of the mountain slopes in a succession of terraces. In the mountains of India, Ceylon and Tibet terracing was also practiced on a large scale. The Chinese farmers made a special effort to take care of their land. These early Chinese found terracing to be one of their most important conservation practices. Soil was often collected in baskets in the valley and carried up the slopes to fill in behind the terrace walls.

SCS Photo

This terraced valley above Becharre, in Lebanon, is pictured in remarkable detail. This was a place of refuge for Christians and is a good example of how some people, driven to the hills for protection, were able to develop an adequate agriculture for survival.

The best example of early terracing in the Western Hemisphere can be found in Peru. Long before the Spanish conquest in the 16th Century, the Inca Indians had done more to bring about absolute soil conservation than can be found anywhere in the Western Hemisphere even to this day. Without tools and machines, such as we have, they constructed irrigation channels, large aqueducts, terraces, and diversions. Many of these structures are still in use.

Ancient terraces were, for the most part, bench type in structure. The walls were built sometimes perpendicular and sometimes sloping. The soil was then filled in until it was level with the top of the wall. The small areas of land formed by this type of terracing had its drawbacks but it did make possible irrigation. Intensive cultivation was often carried out in order to provide the maximum amount of food production. In addition, these early Peruvians used certain types of crop field terraces similar to those constructed today. In many instances these were more ditch-like in nature but were built on a grade around the slope. Ancient peoples undoubtedly considered ditch-like terraces a soil conservation practice and a necessity if farming was to be carried on at all.

Strange as it may seem on first thought, many of our ancient civilizations developed in the mountains. Certain writers and conservations have pointed out that it was necessary to farm these steep slopes because of a scarcity of good land. The actual facts, however, do not seem to bear out these conclusions since in most areas where elaborate terraces were constructed there was much good

land on gentle slopes not too far away merely waiting to be cleared and farmed. The chances are that the people preferred to live in the inaccessable hills in order to be protected against marauding invaders. It wasn't easy to live on the plains because of the difficulty in providing protection against attacks by wandering tribes. Also, the mountain fastnesses made protection easier from the threat of wild beasts. In Luzon we find that the great and well constructed rice terraces were built by a band of people who had been driven by invaders from the plains into the mountains. In the high Yangtse the terraces were built by early Chinese who had escaped from the plundering Mongols. Since these early people had to live in the mountain for protection they had no alternative but to build terraces in order to grow the food necessary to survive.

There has been little learned about the types of terraces in the last several hundred years except in the matter of refinement. Modern type American terraces are similar to some ancient terraces in that they pick up the water at intervals on the slope and lead it off gently thus protecting the land from serious erosion. They are different in that they are designed to permit modern farm machinery to move freely across the terrace ridge whereas most ancient interceptor terraces were more ditch-like in nature.

Our modern American terraces are an outgrowth of ditch-like terraces first used in this country during the late Colonial period. Terraces were first used in modern America in the southeastern part of the country. The need for something to prevent erosion was obvious due to the erodible soils found in the more fertile areas of our southeastern states. Progressive farmers found, by trial and error, that ditches around the slope picked up the surplus water and thereby protected their land from erosion. Some historians give credit to certain farmers for making this discovery entirely on their own. Perhaps a more accurate analysis would credit these farmers with picking up the ideas in their travels to certain parts of Europe and Asia. At any rate, terraces of the ditch type method became common in the 17th Century and were improved and expanded continuously from that day to this.

John C. Calhoun was very interested in soil conservation. Among the practices used on his plantation, "Fort Hill," were ditch type terraces. This type of terrace was installed over all his sloping cropland. As a result of his care Calhoun's land is said to have shown few signs of erosion. Many of his neighbors accepted some of the conservation practices but none of them did as complete a conservation job as did Mr. Calhoun.

Another southern planter who did much for conservation was John Taylor of Virginia. Mr. Taylor was an acquaintance and friend of Thomas Jefferson who was also an ardent conservationist. Mr. Taylor constructed a system of drainage and hillside ditches on his Rappahannock River farm near Port Royal, Virginia.

Pennsylvania was represented among the early conservationists by John Lorain. Mr. Lorain was a native of Maryland. Later in life he became an active member of the Philadelphia Agricultural Society. In 1806 he purchased land in Pennsylvania and farmed in the vicinity of Phillipsburg. He wrote thirteen essays on various agricultural subjects. Mr. Lorain had the idea, generally accepted by most present day conservationists, that land can be used and still conserved. Systems of water diversions were constructed on his farm by careful survey according to the lay of the ground. He believed that they should be laid out properly even though it was sometimes necessary to run them in serpentine courses.

The early ditch methods of terrace

construction for cropland was continually improved. As time passed the farmers discovered that the broader type terraces permitted freer movement across the terraces with farm machinery.

After the Soil Conservation Service became organized in the early 1930's, terracing came in for even more attention. The Soil Conservation Service's approach to the conservation problem, based on proper land use and a combination of practices, placed terraces in a key position in conservation farming. In developing a complete conservation plan therefore, ditch type field terraces, long used as a means of removing surplus water, became a basic practice. Since erosion is caused by improper land use and surplus water, (accumulated by hard or prolonged rains), the foundation for any conservation plan seemed to rest on some sort of system that would remove this surplus water without damage to the land. Regular terrace systems have a two-fold purpose on many Pennsylvania soils that are inclined to be wet. On these kinds of soils they not only protect the land against sheet erosion but remove subsurface water thus making it easier to farm the land. Also, most crops do better when the soils have been drained.

Terrace systems as they are known, are laid out systematically on grades. This grade varies usually from one-tenth to five-tenths per cent. They are placed around the slope at horizontal intervals of about sixty-five to seventy feet apart. All modern ter-

SCS Photo

Other countries are following the lead of the United States. Here we see modern type terraces being built in Venezuela under the technical supervision of SCS employees.

SCS Photo

Terraces on a Lancaster County, Pennsylvania, farm. Terraces are supplemented with strip cropping and good grass waterways. Shown above is the Arthur Weaver farm near Hensel on Highway Route 72.

races are constructed with a wide base and smooth curves so that they can be farmed just the same as the remainder of the field. All farming operations, including tillage, is carried out parallel with the terrace.

The diversion type terrace, often referred to as a "diversion" is just another application of the terracing principle. Diversions, however, are spaced further apart and are supplemented with a protective cover of grass and a filter strip of grass extending at least thirty feet from the diversion channel on the upper slope. Diversions are given a grade of from four-tenths to two per cent. They are usually bigger than the terraces in regular terrace systems but answer the same purpose as regular terraces. They are used primarily on land too steep for a regular terrace system. Properly and rightfully they should be considered diversion type terraces. Stripcropping is usually used as a supplemental practice to diversions.

The construction of terrace systems or diversion terraces is dependent upon proper outlets to dispose of the accumulated water. Many times there will be natural locations where the water can be disposed of without damage to the land. A well sodded ravine or draw is often available. In other cases terraces and diversions can be emptied into the woodland or in good pasture. In many cases it will be necessary to construct and seed waterways well in advance of the terrace construction so that there will be a place to empty the surplus water. These waterways should be well designed and constructed. They should then be adequately limed and fertilized and seeded to a grass mixture that will make a good cover. The grass used should be turf-forming rather than bunchy. Adequate time should be given for the waterway to become a dense sod before the extra water is collected. Periodic fertilizing and mowing will keep all grass waterways, whether natural or constructed, in better condition. They should never be used as a farm roadway. We should be very cautious in installing terraces and diversions until we have satisfactory locations for emptying the surplus water otherwise serious gullying may occur which may do more

damage than if no terraces or diversions had been constructed.

Diversion terraces and watercourses have been successfully constructed with many different kinds of machinery. Some manufacturers have constructed special terracing machines. Ordinarily, these terracing machines are pulled behind wheel tractors. The big, one-man operated, patrol graders have proven very excellent terrace builders. Many farmers have constructed terraces with regular farm plows. Bulldozers and angle dozers are also being used extensively in many Pennsylvania soil conservation districts for terrace and diversion construction.

Terraces should not be expected to do more than is intended of them. The job of terraces is to remove the surplus water without damage to the land. They are not soil builders; therefore in any conservation program it is necessary to supplement them with strip cropping, contouring, good rotations (which include grasses and legumes to build organic matter), and the use of sufficient lime and fertilizer to take care of soil and crop requirements.

The proper use of terraces, whether they be regular terrace systems or diversion type terraces, means much in protecting valuable farm land. Every conservation program should be designed to protect the land during the unusual rain. Terrace systems do much to prevent the loss of topsoil. This topsoil, once lost, becomes a problem in the streams. One of the serious aftermaths of this silt is the damage done to the natural habitat of fish. By keeping the soil and the fertility on the land we help insure better crops and this includes the crop of wildlife.

Cropland terraces and diversions are common in Pennsylvania. Approximately one hundred sixty miles of cropland terraces have been installed on the farms of those cooperating with Pennsylvania's thirty soil conservation districts. On these same cooperators' farms an additional five hundred twenty-five miles of diversion terraces have been constructed.

This discussion on terraces is not intended as a technical treatise on terrace construction but rather an analysis on the history and logic of terracing—a logic that has been understood by people of many races and in many countries for thousands of years. The very fundamental of controlling surplus water on cropland, so easily understood by the half-naked tribes on the high mountains of Luzon 2,000 years ago, should be much better understood by our present day agriculturists and farmers. Do we appreciate even yet, with all the interest and all the money being spent on conservation, the real fundamentals of what it takes to save the topsoil? Finally, do we want a standard of living and a food supply based upon subsoil? We have much to learn evidently, if not scientifically then practically, in getting important conservation programs on the land. Water disposal systems are fundamental—that is, some provision for removing the surplus water that causes erosion. Technicians and farmers alike have a real problem in fitting time-honored practices such as terracing to our present day concept of true erosion control programs. We are faced with a real challenge. This challenge could be stated in the form of a question. Are we as modern day agriculturists and farmers going to do a second rate job of conservation as compared with those far less civilized people of many ages ago? Let us hope that by working together with each individual and group making his or their contribution, we will develop the best possible program for the insurance of permanent agriculture.

Whistlers Wow Harrisburg

DAUPHIN COUNTY—Early in April interested persons in Harrisburg were treated to a rare visit by a flight of whistling swans which rested on the Susquehanna River over the weekend. Many persons called this officer regarding the birds—some inquiring whether the birds had been placed there by the Commission. On Friday, April 30, 1954, there were six more swans visiting on the river—possibly a few Johnny's come-lately who were reluctant to leave the southern climes.—District Game Protector Paul H. Glenny, Harrisburg.

Moving Day

YORK COUNTY—In early April two local sportsmen and I were looking over a proposed refuge site. We observed a woodchuck run across the road with something in his mouth which was alive. Hearing reports that chucks sometimes kill young rabbits, we tried to induce the chuck to drop what he was carrying, but it returned to the den. The squeal did not sound like a rabbit and it appeared the woodchuck was moving his family across the road to another den.—District Game Protector Daniel H. Fackler, Windsor.

Dig that TV Drummer

CAMBRIA COUNTY—Returning to headquarters on the afternoon of April 21, 1954, I observed a rather unusual and amusing incident. As I stepped from my car, I heard a rather odd sound which I finally located as coming from my TV antenna where a flicker was busy trying to drill a hole in the aluminum cross bar. The mast is bolted to the side of the dormer window in my bedroom. This drilling continued for the remainder of the afternoon at frequent intervals and everyone got quite a kick out of it. While it may have been amusing at 4 or 5 p. m. when the same activity was going on for the next three mornings at 5:30 to 6:00 a. m., the unusual part was still there, but the amusing part was gone.—District Game Protector J. L. DeLong, Ebensburg.

Big Brother Act Fails

FAYETTE COUNTY—During April, John Rush, Farmington cattle raiser, related the following to me: He had a minnow trap set in one of his fish ponds and when he checked it a weasel was in it. The weasel was dead from drowning. Apparently the weasel went in to get some fish and could not get out. Perhaps this weasel was trying to be like his bigger brother, the mink.—District Game Protector J. R. Hiller, Uniontown.

Sneak Attack

FULTON COUNTY—I became absorbed watching red ants literally eating a garter snake alive, beside one of the large ant hills on State Game Lands #53. I was wondering how they attacked him in sufficient numbers to stop his flight, when they answered my question for me. A rein-

forced patrol had slipped up my pants leg. They must have had their watches synchronized for they set their hooks at the same time.—District Game Protector Carl E. Jarrett, McConnellsburg.

Stinky Strikes Again

CHESTER COUNTY—One evening while checking groundhog hunters near Marshallton, I approached one of a group of hunters who related the following experience. He stated that he shot a groundhog in a gully and when he was on his way down to pick up the groundhog he noticed a skunk walking towards him. He shot the skunk and four others which were following it. His rifle was empty and there was still one more skunk walking towards him. He picked up a brick from an old foundation and threw it at the sixth skunk. He hit him with the brick, but before it died it left something fly that one groundhog hunter will never forget. The hunter lived in Chester and his hunting companions refused to let him ride home with them. They did however volunteer to bring him his car so he could get home.—District Game Protector Peter J. Filkosky, West Chester.

Amateur Electrician

MONTGOMERY COUNTY—A cooperator on one of our Rabbit Farms related the following to me. One evening the lights had gone off in the house. Assuming it had been caused by a blown fuse, the man went to check the fuse box in the cellar. While checking with the flashlight, he felt something pulling at his hair. Shining the light upward he saw a raccoon sitting on top of the fuse box. The coon while climbing onto the box had pushed off the master switch, plunging the house into darkness.—District Game Protector Donald L. Croft, Hatboro.

Game Collector

ARMSTRONG COUNTY—This report was sent to me by Deputy Ruppersberger of R. D. 1, Freeport. On April 3, 1954, Dale Rowley and Robert Snyder of R. D. 1, Freeport, shot a great horned owl along Buffalo Creek near Slatelick. Investigations later found a nest with two fledglings in it. They counted the remains of 14 rabbits, one wood duck, one rat and an unknown number of ringnecks that had been killed and carried to the nest.—District Game Protector William H. Shaffer, Kittanning.

Snake in the Grass

BERKS COUNTY—While assisting the Food and Cover Corps in planting food plots on Propagating Area 26, we saw a hen pheasant jumping and tumbling in the grass. When she got about 50 feet from us, we investigated and found a four foot blacksnake which I believe was heading from her nest.—District Game Protector Harry H. Rickert, Kutztown.

Groundhog Braves Blessed Event

HUNTINGDON COUNTY—One day while on patrol with Deputy Webster, I noticed a groundhog hole near where we had stopped the jeep. A few moments later Webster called my attention to the fact that there were strange noises coming from the hole. I then went over and looked in the hole and there sat the woodchuck, brave as anything. The animal was making very loud grunting noises and would not even back up when I rubbed a stick up against its teeth. It made no attempt to bite the stick though. We thought maybe it was in trouble, so we started to dig her out when we saw where she was packing cow hair and soft down into one upper part of the hole making ready to have her young. So we left her alone satisfied that we had been thoroughly told how to "not disturb her in her family troubles."—District Game Protector Dean M. Lesnett, Huntingdon.

Persistent Bear Creates Circus Confusion

LUZERNE COUNTY—On April 10, I had some men working on State Game Lands #187. Around 1:30 p. m. I returned to the storage building to pick up a few tools and everything seemed to be in order. Upon returning that evening I found the corn crib door torn from its hasps and hinges and lying about fifteen feet away. The next day I had the men fix it, but for seven nights the same incident occurred. Finally getting tired of replacing the door every day, I contacted District Game Protector Lettie and informed him that some culprit was slowly wrecking our crib. That afternoon we took coffee and sandwiches with us and prepared for a long seige in waiting. About 7:30 p. m. that evening we heard the hasps and hinges rattle and looking out between cracks from an adjoining building we spied about a 300 pound bear pulling at the lock. The reason this incident seemed so peculiar is that at no time did this bear leave any scratches or marks indicating his presence. You'd swear this bear came from a circus.—District Game Protector Norman J. Forche, Conyngham.

World's Only Fishing Dog

SUSQUEHANNA COUNTY—There is a small stream running through W. R. Spencer's back yard in Thompson. Some years ago there was a ten inch trout living there which the Spencers were in the habit of feeding. They would hold bread or a worm in the water and the trout would eat from their fingers. If the fish was hiding they could call him to dinner by agitating the water with their hands. One day the family dog, a Spaniel, was drinking at the trout's customary feeding place when all of a sudden the dog jumped backward and with him came the ten inch trout. Fortunately, Mr. Spencer's father was at hand to return the fish to water. It is their opinion that because agitating water was the signal for meal time, the trout mistook the dog's lapping tongue for a choice morsel of food and had a bite. Of course, the startled dog reared back and thereby landed a ten inch trout and in so doing earned the distinction of being the world's only fishing dog.—District Game Protector Donald Day, Susquehanna.

Hen Turkey Heads Home

ELK COUNTY—I have been seeing a turkey hen in close proximity of my chicken yard. I thought of trying to chase it in order to prevent possibility of its getting disease from the chickens. However, I decided to find out why it persisted in staying so near the house and activity. It had a very good reason and still has—a nest with nine eggs at last check.—District Game Protector Vern A. Van Order, Wilcox.

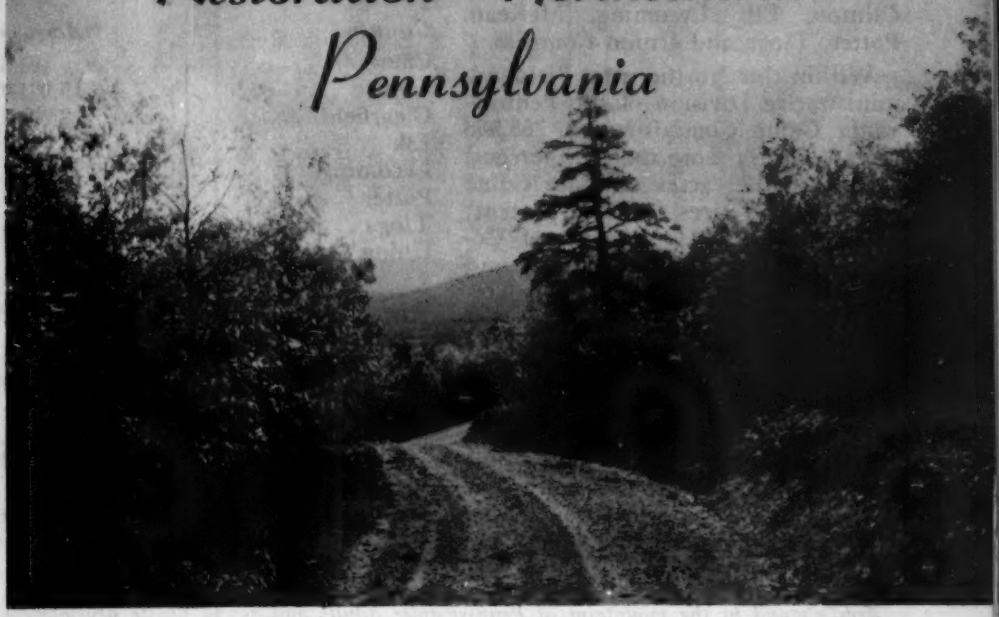
Early Birds

LANCASTER COUNTY—While on my way to patrol for Fish Warden Bielo on April 17, I was quite surprised to see a brood of young pheasants. I counted eight of the little fellows although there could have been a couple more. This is the earliest that I have ever seen young pheasants. They looked like they might have been a week old.—District Game Protector J. P. Eicholtz, Strasburg.

Sluiceway to Safety

WAYNE COUNTY—On April 22, 1954, I attended the meeting of the Wayne County Sportsman's Club. While there I gave a report on game stocked in my district. One of the men present, Paul Horst, told the members of the club about an incident which he has witnessed a number of times this spring. Mr. Horst has been feeding a number of ringneck pheasants near his home this past winter. One of the cock birds was killed on the highway. Since that time the remaining birds have been crossing the highway through a sluice pipe in front of Mr. Horst's home. The birds will fly to the bank of the road and then go through the sluice pipe single file. Since that section of the highway on U. S. Route 6 is being rebuilt, Mr. Horst hopes that they will not remove this sluice pipe in their rebuilding program.—District Game Protector Robert H. Myers, Honesdale.

Federal Aid in Wildlife Restoration—Northcentral Pennsylvania



The following article, fifth in a series of six, is the result of combined effort and teamwork. Field data and reports were compiled by Sam Kern, Land Utilization Assistant of the Northcentral Division. The article was prepared for publication by Division of Land Utilization personnel at Harrisburg. Photos by Commission photographers.

FEDERAL Aid in Wildlife Restoration was inaugurated as a program on July 1, 1938. Under this legislation, known as the Pittman-Robertson Act, Wildlife Research and Restoration Projects are approved in various states, and funds provided to finance seventy-five percent of the costs. (Expenditures for wildlife protection, general departmental administration, propagation and stocking of game are not allowable under terms of the Act.) Programs are financed from federal taxes imposed on sale of firearms and ammunition. Each state receives a proportionate amount of this fund each year, dependent upon number of licenses sold and the state acreage compared to the whole of United States.

From 1938 to 1947 receipts from these excise taxes were limited and projects were confined largely to purchase of hunting lands and research problems.

In 1948 the Pennsylvania Co-operative Farm Game Program was expanded under terms of a Pittman-Robertson project, approved to lease, establish and develop new areas. Since 1949 development of State Game Lands and other leased areas has also been partly financed with these federal funds. All activities receive prior approval and periodic inspection by personnel of the United States Fish and Wildlife Service.

This article is written to acquaint interested sportsmen and conservationists with the use of Federal Aid monies. It reports on accomplish-

ments in wildlife restoration throughout Northcentral Pennsylvania which includes Cameron, Centre, Clearfield, Clinton, Elk, Lycoming, McKean, Potter, Tioga and Union Counties.

Within this Northcentral Field Administrative Division of the Pennsylvania Game Commission is 255,568 acres (slightly more than 28 percent) of the 902,179 acres of State Game Lands; 62,679 acres (over six percent) of the 1,048,145 total acres of Cooperative Farm Game Projects; and 23,171 acres (slightly less than twenty-one percent) of the 111,819 acres of other leased projects throughout the State. In addition, approximately 250,000 acres of Allegheny National Forest falls within this division and is managed for wildlife under terms of a Cooperative agreement.

Many State Game Lands were acquired with the help of Federal Aid funds. In the Northcentral Division acreage in various counties was purchased as follows:

County	*Acreage*
Cameron	164.5
Centre	15,971.7
Clearfield	2,200.0
Elk	424.1
Lycoming	2,339.1
Potter	1,319.7
Tioga	1,675.5
Union	295.7
Total	24,390.3

These areas were inspected and approved by representatives of the United States Fish and Wildlife Service.

Employes of this Northcentral Field Division of the Pennsylvania Game Commission have encountered many

(Continued on Page 35)

Bear abound in the mountains of Pennsylvania. Adults and young utilize development areas.

STATE GAME LANDS—ACCOMPLISHMENTS WITH PITTMAN-ROBERTSON FUNDS

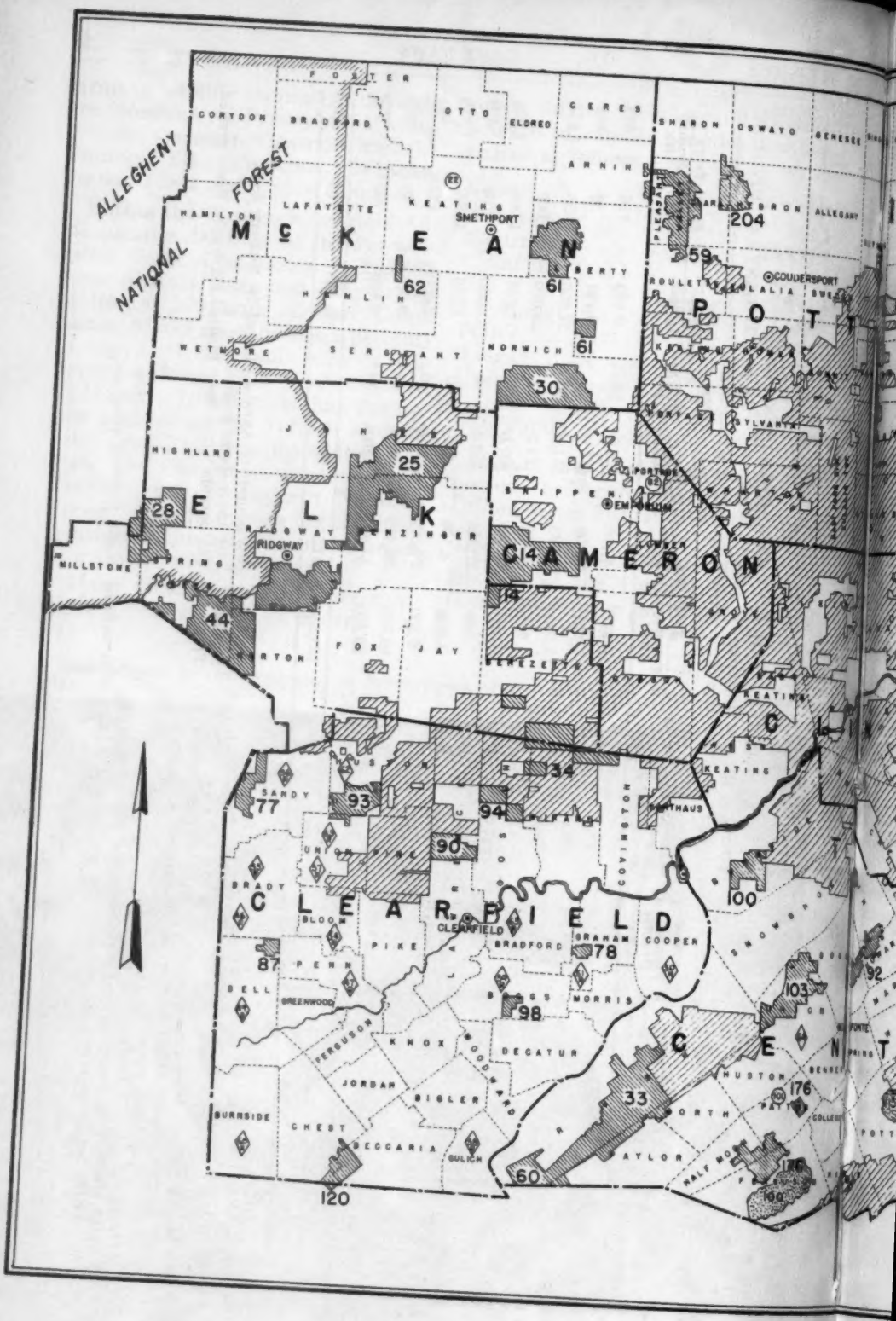
January 1, 1949 to December 31, 1953 NORTHCENTRAL DIVISION

County	Food Strips				Seedlings		Forest Cuttings			Fruit Trees	
		Planted to	Seeded to	Maintained				Border-Edge			
	Cleared Acres	Grains† Acres	Clovers Acres	in Sod Acres	Evergreens No.	Others No.	Release Acres	Width* Ft.	Length Ft.	Released No.	Pruned No.
Cameron	64.0	281.0	39.0	56.0	4,000	3,400	25.0	33	9,360	716	657
Centre	85.0	551.0	336.0	359.0	51,750	34,005	31.0	40	58,100	30	302
Clearfield	1.0	75.0	50.0	29.0	15,000	1,083	351.0	38	32,900	1,635	1,254
Clinton	53.0	155.0	44.0	15.0	800	330	23.0	43	39,010	1,000	.....
Elk	184.0	348.0	214.0	122.0	30,000	74,500	307.0	25	17,280	1,006	1,226
Lycoming	71.0	335.0	66.0	164.0	500	37,225	123.0	50	11,200	310	499
McKean	66.0	165.0	43.0	23.0	6,000	6,100	33.0	40	5,520	2,192	1,359
Potter	155.0	312.0	49.0	380.0	9,200	36,500	43.0	40	4,000	452	793
Tioga	136.0	510.0	229.0	597.0	16,900	34,415	13.0	35	9,075	40	479
Union	107.0	85.0	38.0	22.0	29,500	54,200	20.0	18	4,600	400	240
Totals	922.0	2,817.0†	1,108.0	1,767.0	163,650	281,758	969.0	36*	191,045	7,781	6,809

MISCELLANEOUS

Centre ....180 pounds Shrub Seed sown in Nursery Beds—S.G.L. No. 176.
Clearfield ..2 bushels Watercress planted. 58 Apple Trees grafted.
Elk .....1000 pounds Millet planted for Waterfowl. 19 bushels Watercress planted.
Lycoming ..70 pounds of Shrubs planted in Nursery Beds.
McKean ...10 Apple Trees grafted.
Tioga .....25 pounds Shrub Seed planted. 65 Apple Trees grafted.

* Average.
† Surplus grains were harvested and distributed for use by Wildlife.
Note:—Shrub Seedlings raised in Nurseries on State Game Lands were utilized in the planting program.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NATIONAL
FOREST
FOSTER
CORYDON
BRADFORD
OTTO
ELDRED
CERES
SHARON
OSWAYO
GENESEE
HAMILTON
LAFAYETTE
KEATING
SMETHPORT
M c K E A N
HAMLIN
WETMORE
SERGEANT
NORWICH
BERTY
ROULETTE
COUDERSPORT
P O T T
HIGHLAND
ELK
RIDGWAY
MILLSTONE
FOX
JAY
CAMERON
EMPORIUM
SHIPPEN
LUMBER
SENECA
KEATING
SANDY
BRADY
CLEARFIELD
BLOOM
PIKE
BRADFORD
GRAHAM
COOPER
COVINGTON
KARTHAUS
PENN
BELL
GREENWOOD
MORRIS
FERGUSON
KNOX
WOODWARD
DECATUR
HUSTON
JORDAN
BIGLER
BURNSIDE
CHEST
BECCARIA
GULICH
TAYLOR
HALF MOON
CENTRE
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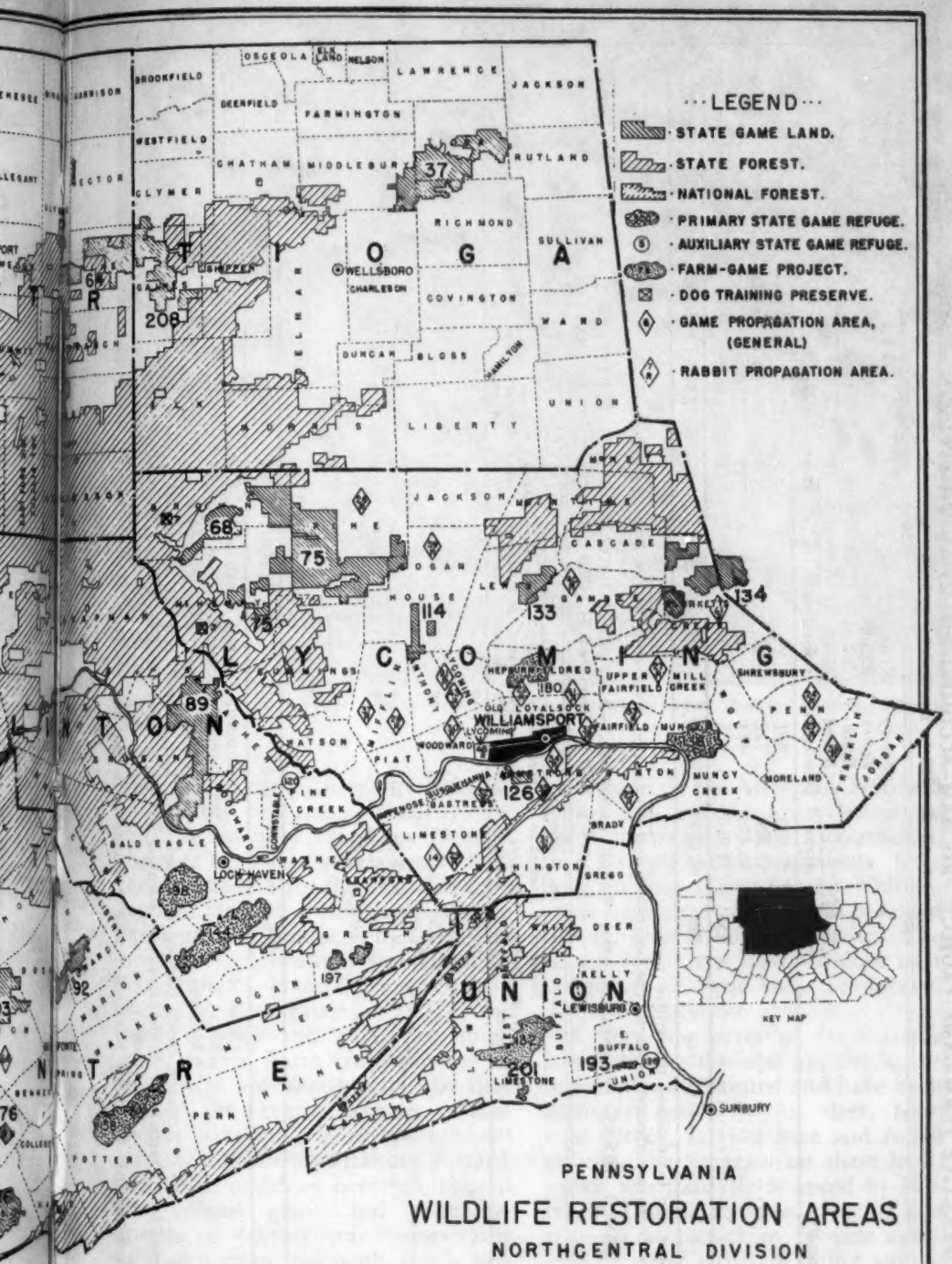


PENNSYLVANIA

WILDLIFE RESTORATION AREAS

NORTHCENTRAL DIVISION

PENNSYLVANIA GAME COMMISSION

Scale: 0 ——— 6 Miles July 1954

L.A.W.

COOPERATIVE FARM-GAME PROJECT PROGRAM—ACCOMPLISHMENTS WITH PITTMAN-ROBERTSON FUNDS

January 1, 1948 to December 31, 1953 NORTHCENTRAL DIVISION

County	Leased		Safety Zones Established Dismantled	Refuges Established Maintained	Food Strips and Nesting Cover		Seedlings Planted			Wildlife Borders Developed
	Farms	Acres			Strips	Acres	Coniferous	Multiflora Rose	Other Species	Lin.Ft.Cut
Centre	150	20,990	591	25	5	4	125,900	27,900	4,750	2,900
Clinton	138	18,329	712	11	2	4	46,650	6,400	3,000	2,800
Lycoming	46	5,450	281	10	20	17	23,000	3,300	500	1,500
Union	135	17,910	655	3	1	1	6,950	19,000	4,150	4,500
Totals	469	62,679	2,239†	49*	28	26	202,500	56,600	12,400	12,700

* All Refuges are maintained the entire year.
† All Safety Zones are erected prior to the beginning and dismantled after close of the Hunting Season.

OTHER LEASED AREAS—(Propagation Areas—Rabbit Farms, etc.)—ACCOMPLISHMENTS WITH PITTMAN-ROBERTSON FUNDS

January 1, 1949 to December 31, 1953 NORTHCENTRAL DIVISION

County	Food Strips				Plots		Seedlings		Forest Cuttings			Fruit Trees	
	Cleared Acres	Planted to Grains Acres	Seeded to Clovers Acres	Maintained in Sod Acres	Purchased No.	Acres	Evergreens No.	Others No.	Release Acres	Border-Edge Width* Ft.	Length Ft.	Released No.	Pruned No.
Cameron	....	24.0	....	....	2	4.3	....	....	....	....	....	....	....
Centre	....	....	....	....	1	1.0	....	....	....	....	....	....	....
Clearfield	....	2.5	2.5	....	12	13.3	12,500	2,076	....	13	355	103	103
Clinton	....	16.0	....	....	....	....	....	....	....	....	....	....	....
Elk	....	9.4	9.0	10.0	8	16.3	....	99	122.8	....	....	2,718	2,425
Lycoming	....	....	20.0	....	28	13.4	11,800	6,500	27.0	22	13,450	22	261
McKean	....	35.0	2.0	....	....	....	....	10,350	....	....	....	2,336	2,288
Potter	....	....	....	....	15	22.5	....	....	....	....	....	....	....
Tioga	....	....	....	....	2	3.5	....	....	....	....	....	....	....
Union	....	....	....	....	....	....	....	....	....	....	....	....	....
Totals	....	86.9	33.5	10.0	68	74.3	24,300	19,025	149.8	18*	13,805	5,179	5,077

MISCELLANEOUS

Clearfield .....Constructed 37 large brush piles.
Elk .....20 acres of aquatic foods were planted†
McKean .....10 spring seep areas developed for wildlife.

* Average. † Acquatic foods planted included Wild Rice, Sago Pondweed, Duckmeal, Coontail and Arrow-Arrum.

Note:—Twenty-four bushels of Watercress was planted in spring areas in Elk County and four dusting areas prepared in the Wild Turkey Range.

Work on the Allegheny National Forest is included in the above totals.

Flocks of wild turkeys utilize forest openings, feeding upon planted grains, clovers and insects.

problems in conducting their wildlife restoration program, primarily the result of an unbalanced sex ratio in the deer herd, and excess numbers of these white-tails for the available food supply. Sprouts and reproductive shrub growth, produced by forest cuttings, are overbrowsed and killed by these animals. Planted evergreens and shrubs are often eaten before they can produce food and cover for small game species. Farm crops planted in food strips are usually eaten by deer before the grain matures. These factors make small game management a rather difficult undertaking. Regardless of the problems involved, habitat for upland game and migratory species in Northcentral Pennsylvania has been improved with funds provided under the Pittman-Robertson Act.

Although a proportionate amount of wildlife restoration work in this portion of the Commonwealth has been done on the Allegheny National Forest and various areas leased by the Pennsylvania Game Commission, the greatest accomplishments have been on State Game Lands which are areas purchased with funds provided through sale of hunting licenses. The reason for this is obvious since over one-fourth of these lands are located in the Northcentral area.

A very few acres of State Game Lands in the division are fields, the remainder are forested and have been managed primarily for deer, bear, wild turkey, varying hare and ruffed grouse. The program on these lands which was partially financed by Federal Aid funds, included clearing and removal of timber to provide openings for food strips, planting annual grains and then seeding the plots to perennial grasses and clovers; annual mowing of grasses and clovers to improve succulent foods; felling large trees along edges of openings and

fields to stimulate edge growth of berry producing shrubs and vines; planting evergreen trees, shrubs and vines to improve food and cover for wildlife; thinning or removing second growth timber to create additional low growth for game cover and provide deer browse; removing overshadowing timber around wild apple trees and annual pruning to increase fruiting capacity; creating small ponds or marsh areas and planting aquatic plants to obtain full utilization by wild waterfowl and other wildlife species. Lands on which these practices were applied are located in practically all counties. Many sportsmen have observed and are familiar with this management work, having accompanied Game Commission employes to project areas.

Development activities similar to those applied on State Game Lands have been conducted on the Allegheny National Forest in Elk and McKean Counties. Wildlife development on these lands is a responsibility of the Pennsylvania Game Commission, coordinating its work with the United States Forest Service. Although many acres of food strips were planted and maintained since the program became effective in 1949, emphasis was placed on releasing game food producing trees, shrubs and vines by felling overshadowing tree growth. A total of 111 acres in Elk County and 26 acres in McKean County was improved by these release cuttings, benefiting wildlife on hundreds of surrounding areas. In addition, thousands of wild apple trees were released from competitive growth and pruned to increase the amount of fruit available for use by wildlife.

Elk County was selected for the initial marsh or small dam development program, whereby dams will be constructed to flood marshes on State Game Lands and the Allegheny National Forest. Project personnel have surveyed five promising sites and prepared plans necessary to obtain approval for construction of small dams at these locations. The structures will impound and make available many additional acres of water to attract migratory waterfowl. The program of planting aquatic plants, now conducted on nearby ponds, will be expanded to include these sites.

State Game Lands #25, near Johnsonburg in Elk County, is well known for the forest—wildlife development program initiated in 1947. For over five years personnel employed under a Federal Aid Development Project removed sawlogs and pulpwood from the area. Beech, birch, maple and cherry timber was selectively cut and removed following accepted forestry practices, the plan being to correlate Forestry and Wildlife Management. Resulting sprout growth and reproduction on over 800 acres treated in this manner, indicates that forest game may be managed through proper harvesting of timber stands. Wildlife habitat was considerably improved by these forest operations.

A planting program has also been conducted on private farm areas located within the heavily wooded portion of the Northcentral Division. Approved by the Commission on an experimental basis and limited to portions of Cameron, Clinton and McKean Counties, the program involves leasing fields adjacent to forest and game land areas, and planting two to four acre strips each year to grains and permanent grass-clover mixtures. By utilizing these existing fields the normal cost of clearing plots on nearby State Game Lands is eliminated. Under terms of these agreements twenty-four acres were planted in Cameron County, sixteen acres in Clinton County and sixteen acres in McKean County. It is too early to judge the merits of this phase of the project, but personnel have noted considerable utilization by all forest game species, particularly deer and wild turkey.

Forest cuttings provide browse for deer, the most common big game animal found in northcentral Pennsylvania.

As many readers know, the wild turkey range now extends throughout the Northcentral portion of Pennsylvania. Large numbers of this favorite game bird are killed each year. At least a small percentage of the increase in wild turkey may be credited to the creation of openings and planting of food strips in heavily wooded areas throughout the division. Food in the form of grains and insect life are important in their diet. Commission employes and sportsmen alike are pleased with the increased number of wild turkey flocks and the hunting they provide.

With the Northcentral portion of Pennsylvania primarily forested, development for farm game species is limited. Nevertheless, wildlife habitat has been greatly improved on rabbit farms in Clearfield and Lycoming Counties with the aid of Pittman-Robertson funds. Practices applied on these private farms included the planting and annual mowing of clover strips near low brushy cover, cutting large trees along field edges to stimulate and help establish low shrub growth, constructing large brush piles along woodland borders to provide rabbit retreats, releasing wild apple trees along forest edges by removing trees that shade them and the pruning of these fruit trees to increase production of fleshy foods. In addition, thousands of evergreen tree seedlings were planted on steep field slopes and odd corners to provide protective cover for all wildlife. The same practices were applied and found to be beneficial on Propagation Areas and other leased lands.

The Cooperative Farm Game Project Program was expanded into the Northcentral Division in 1947. Eight projects are now located in the four less densely forested counties of this

Development of natural marsh areas by construction of small ponds will attract waterfowl and improve a sport that is becoming increasingly popular.

division. While the projects are not numerous, several contain over ten thousand acres. These were established in the long narrow agricultural valleys found in this region.

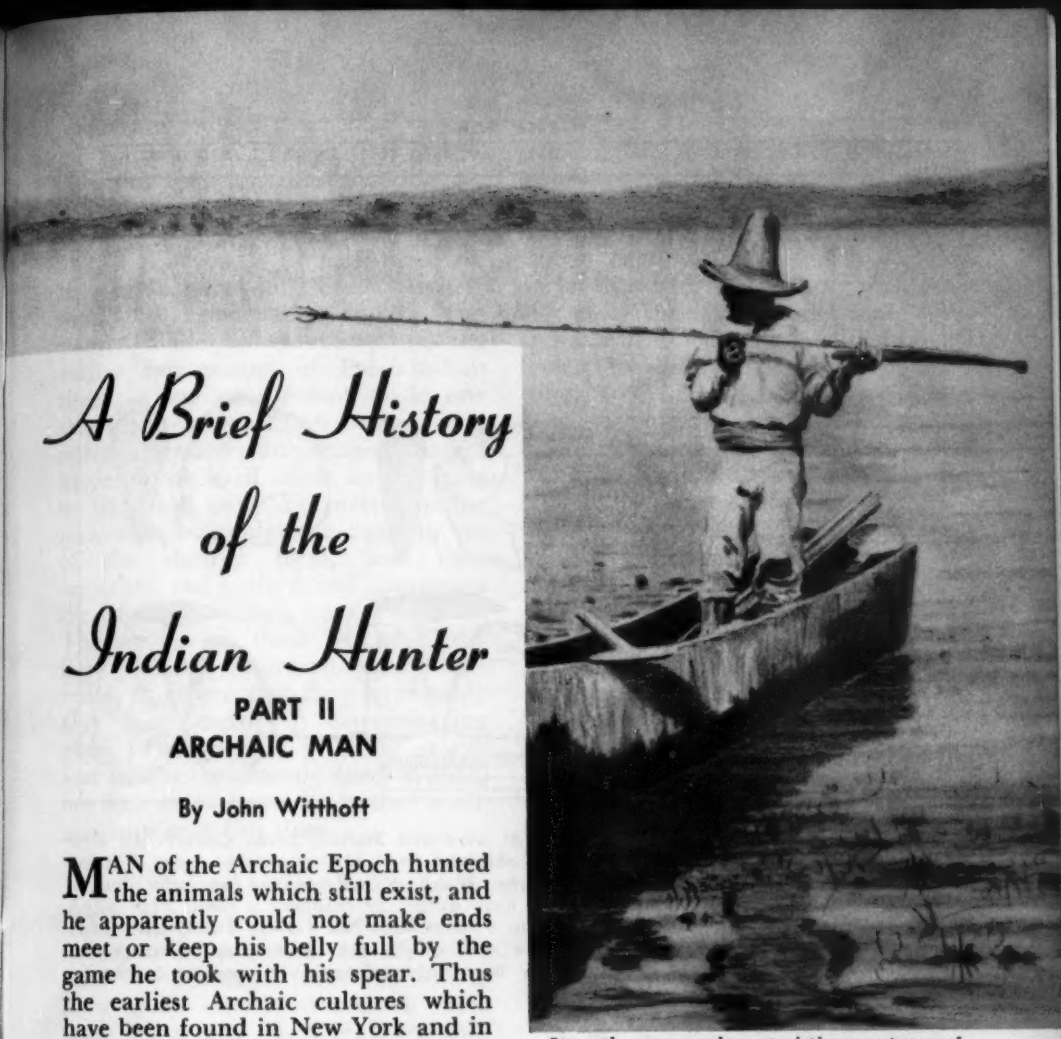
Many of the restoration practices accomplished through the use of Pittman-Robertson funds are of a permanent nature. Planting farm crops on contour strips, establishing multiflora rose hedges, planting evergreen and food bearing seedlings, constructing farm ponds, draining wet fields to provide nesting sites, purchasing and planting food and nesting strips and cutting and planting woodlot borders have all materially aided in the wildlife development program. Cooperators were given 14,200 pounds of rye grass seed for planting in the last cultivation of corn. A total of 301 pints of crow repellent were distributed to cooperators in an effort to reduce corn seed damage by birds and rodents. Technical assistance and advice were rendered to cooperators in establishing the numerous conservation practices on the land.

While more than four hundred and sixty farms were added to the Cooperative Farm Game Program during the six years of operation with Pittman-Robertson funds in this one division, the statewide program now consists of 10,383 farms containing 1,048,145 acres.

The Cooperative Farm Game Project Program has proven so popular with landowners of the counties within the Northcentral Division that there is a great backlog of requests for participation. Game Commission policy does not permit further major expansion at this time. Most of the available funds are being used to develop sound wildlife conservation practices on farms now in the program.

Accompanying tables outline accomplishments on lands owned and leased in Northcentral Pennsylvania by the Game Commission. These restoration activities were partly financed with funds supplied under the Pittman-Robertson Act. The map designates locations of these project areas. Food and cover for wildlife were improved by the many practices previously mentioned.

This is the fifth of a series of articles on each of the Commission Field Division. These special reports to Pennsylvania Sportsmen and conservationists tell how Pittman-Robertson money has been and is being spent in an effort to maintain and improve wildlife conditions. It is hoped that these will encourage you, as a sportsman, to personally visit and inspect this important management work.



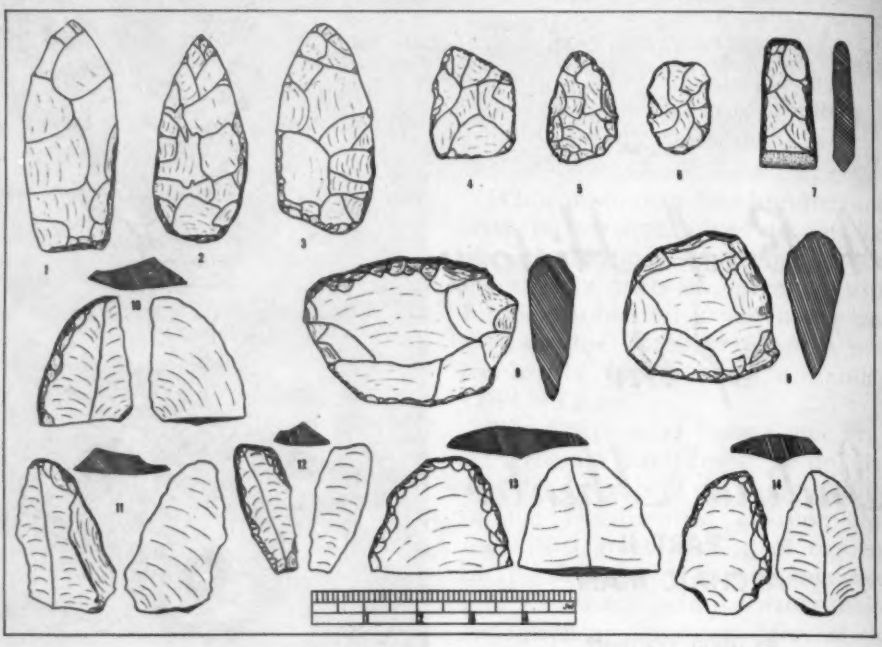
A Brief History of the Indian Hunter

PART II
ARCHAIC MAN

By John Witthoft

MAN of the Archaic Epoch hunted the animals which still exist, and he apparently could not make ends meet or keep his belly full by the game he took with his spear. Thus the earliest Archaic cultures which have been found in New York and in the West represent people who often lived on plant foods, especially porridge made from acorn-flour and meal from other seeds. The great changes in American life which characterized the Archaic Epoch were: greater dependence on foods which did not come from hunting, especially plant foods; abundance of stone grinding tools which were used to make flour from seeds; the everyday manufacture of tools from non-flinty stones by battering and grinding techniques (which did not replace flint-chipping, but were used along with it); the ordinary use of stone axes and other chopping tools of several types. All of these details of life were innovations, and were things which seem to have been completely unknown to the Paleo-Indian peoples. Each item on this list represents an invention or a series of inventions, a gain by mankind in efforts to make a better and more secure living from the world about. All of these new methods in making a living may have been invented in the old world and carried here by new immigrants; they may have originated here, but they were also invented at nearly the same time in several parts of Europe and Asia. Regardless of their origin, they are good examples of the ancient roles of invention and innovation in improvement of the lot of man. In later Archaic times,

Spearthrowers, characteristic weapon of Archaic Indians, is still in use today among the Eskimo and Australia aborigines. The drawing illustrates the method used in throwing the light spear.



These tools come from the DeTurk Site at Neversink Station, Berks County. All were chipped from Quartzite which the Indians obtained from the mountain slopes at Sally-anne Furnace, Newmanstown, and from the Welsh Mountains in Lancaster County. No. 1-3 are spearpoints, the bases of which were dulled by chipping a blunt edge which would not cut the cords lashing the point to a spearshaft. No. 4-6 are knives with edges worn by cutting and skinning. No. 7 is an adze blade, one of the two oldest ground stone tools found in Pennsylvania. No. 8-9 are choppers, probably used in butchering game. No. 10-14 are scrapers.

American men made other important advances, which included effective fishing methods, the use of river clams and ocean shell-fish as food, trapping devices, and a special type of hunting tool, the spear-thrower, which I shall discuss later.

We now recognize two periods within the Archaic Epoch, the Early and Lake Archaic Periods. It is very likely that these should be divided up into a great many separate times, since we know relatively little of these remote ages and are only beginning to glimpse the great variety of culture types and tool forms which were the product of Archaic man. In early Archaic times, the hunting tools which survive are heavy spearpoints which were chipped from many different stones, some of them flints and most of them coarse materials, even river pebbles. They are always crudely formed, as compared to earlier and later tools, and they usually have a tang for lashing to the shaft. The distinctive thing about the Early Archaic spearpoint is the lack of any notching for the lashings; these spears have straight or tapered stems.

The other ordinary tool of Early Archaic man was the chopper, a sort of cleaver or heavy knife about as large as a man's hand, probably used in butchering game. Choppers are usually very crude, and were, ordinarily, crudely chipped from coarse-textured stones rather than from flint. They were the ancestors of all later stone axes. Scrapers or beveled tools

are not common in most sites of this age, and they are most notable for their crude workmanship. Sites of this period are as yet poorly known, and are all believed to be more than six thousand years old. Early Archaic tools are remarkably clumsy and poorly made as compared to the earlier implements of Paleo-Indian times. These people had made one important advance in stone technology, however; they shaped hatchet blades from hard shale and granite by battering away the surface of the rock with a cobblestone until it was of the desired form, and then smoothed the surface and sharpened the edge by grinding on a whetstone. The earliest of these hatchet-blades were probably improved types of the rough choppers, and they were probably most useful in dismembering game. The earliest grinding stones and pestles, apparently used in making flour from acorns and other seeds, also appear at this time.

The Late Archaic Indians

The Late Archaic Period is believed to have begun slightly more than five thousand years ago and to have lasted until about three thousand years ago. Earlier than this, people were not numerous in North America, and the relics of their existance are not abundant, but the Late Archaic peoples seem to have been the first really successful and populous citizens of our area. Spearpoints of this period are more numerous than all other kinds put together, and one is apt to be found on any field or in any garden in the state. The vast majority of the campsites from which we collect Indian relics are of this age. The tools of this period are greatly varied, and most of the ordinary types of relics which are familiar to us are really the particular tool types of these times. The spearpoints range from very small to very large, but they all are characterized by a tang of some form or other which has crude, broad notches or constrictions to receive the lashings which fastened the flint tip to the spear-shaft. The majority of them were not used on lances (stabbing spears) but rather on javelins which were flung with the aid of a special hunting tool, the spear-thrower, which is described later. The ordinary tomahawk of our collections, the axe with a groove to hold the handle, was the common woodsman's axe of this period, and was apparently not used in earlier or later times. Most of the stone pestles, the so-called "corn grinders," belong in this period, and were used for crushing acorns, not corn, into flour.

The man of Late Archaic times used every food resource which he could find, and was a hunter, trapper, fisherman, and collector of wild plant foods. In western Pennsylvania he sometimes dug river clams, but he apparently did not use shellfish in more easterly areas. His burials and the skeletons of his dogs have been found and studied in large numbers; I have already described his bones as identical with later Indians, and his dog deserves more complete discussion in a somewhat later section of this paper. I do not want to describe all of his tools in detail, but should mention the most important of the hunter's implements and indicate how they were used.

An Archaic Hunting Tool— The Spearthrower

In Archaic times, our Indians had not yet learned to use the bow, and the lance or stabbing spear was no longer the usual hunting tool as it had been in Paleo-Indian times. Instead, the Archaic hunter killed his game with a light javelin, which was propelled by a lever-like tool, the spearthrower. This tool is somewhat difficult to explain, because we use nothing that in any way resembles it, and its mechanical principles are not familiar to the ordinary person. Nevertheless, it was at one time an

important and ordinary implement for hurling spears, used by many peoples of the world. It was the weapon which Aztec warriors used against Spanish soldiers during the conquest of Mexico. The spear-thrower may still be seen in use today among Eskimo and among the aborigines of central Australia.

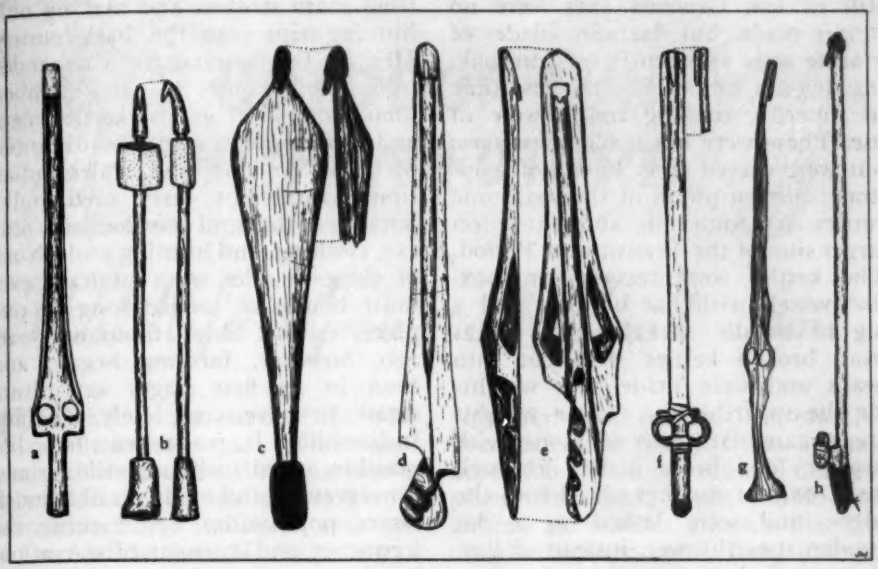
The spearthrower is a short bar of wood, about two feet long, with a handle at one end and a hook at the other. The hook fits into a socket at the back end of the spear shaft, and the spear is thrown by slinging it from this hook. The spearthrower has several consequences in throwing spears: it lengthens the arm by about two feet, vastly increasing the length of the arc and the velocity by which the spear is thrown; it magnifies the turn of the wrist in throwing a spear; it permits all the thrust to be delivered to the butt of the spear, rather than to the middle of the shaft (as in hand-throwing), so that less force is lost; it permits adding weights to the hook-end of the spearthrower, so that this lever can be swung with great momentum, somewhat like a golf club. Modern primitives who use the spearthrower, Eskimo and Australian, handle the tool with great accuracy and skill, and are able to hurl a spear with tremendous force by this device, enough to drive a spear quite through a kangaroo or bury a harpoon deeply in a seal.

Archaic spearthrowers of the eastern United States are known only from harder parts of the tools which have survived, and the wooden shafts have long since rotted away. However, these hard parts, stone weights and antler handles and hooks, have been found together in graves many times, with their holes lined up as they were set on a wooden rod. A great variety of stone weights for spearthrowers are found; the commonest, called a "bannerstone," resembles a double-bitted steel axe, with a drilled shaft hole. Bannerstones were used only during the Late Archaic Period, and other types of weights, especially those called "birdstones," were used in somewhat later times. The bow did not appear in this country until a much later date, probably not more than two thousand years ago.

The Indian Dog

Indian dogs of the Archaic Epoch were exactly like those kept by Indians in historic times and seen and described by our ancestors: these breeds are now, however, completely extinct. They were small wolf-like animals, ranging in size from that of a beagle to that of a fox. They did not bark like our dogs, but howled in wolf fashion. Our forefathers thought they were merely a domesticated fox or coyote, but the bones of these dogs prove that they did not originate from any American fox or wolf but were a true dog of primitive type which had originated in Asia. They were most closely related to the wolves of Asia, and the skeletons almost never show any evidence of cross-breeding with American foxes. The Indian dog closely resembled the Dingo of Australia or the primitive dog of the Andaman Islands of southern Asia, and was brought here more than five thousand years ago. Neither was it at all closely related to the Eskimo husky or malemute, or to the Siberian dog of the Alaskan Eskimo; these are much more advanced and specialized breeds. Unlike the Indian dog, the Eskimo dogs do frequently breed with wolves, and are much more courageous, aggressive, and useful dogs than were the Indian breeds. The Indian dog was a half-wild scavenger who was completely dependent upon humans for food and survival.

Indian dogs were kept in large numbers during Archaic times, and do not seem to have been so numerous in later times. However, at the time of the first white explorations,



Spearthrowers from various times and places. "A" is a Tarascan spearthrower from Mexico; "B" is a reconstruction of a Late Archaic specimen of the eastern United States; "C" is a paddle-shaped wooden thrower from Australia; "D" is a northern Alaskan Eskimo specimen; "E" is an Eskimo thrower, more than 500 years old; "F" is from Arizona; "G" is from Florida; "H" is from coastal Peru.

the Huron of Ontario kept huge numbers of dogs; these people formed such a dense population that they had nearly exterminated the deer and other game of their area, and the dog was their major source of meat. As far as we know from early accounts and from the archeology, the Indian dog was kept for only a few purposes. Most important, dogs were eaten, and this was probably their main value. They were also kept as scavengers, to clean up garbage and excrement about the camp. They were of some value as watchdogs, to set up a howl when prowlers appeared. They were apparently of almost no value in hunting; they lacked the bred-in abilities of a good field dog, and they were kept by people who had never developed methods for hunting with dogs. They were not fed meat from the chase, but lived on garbage, mice and such small critters, and fish. At times they seem to have fed entirely on fish, and, in excavating Indian sites, we frequently find dog manure preserved; it is made up almost entirely of partly-digested fish bones. We believe that dogs were not kept as pets, but as scavengers, as an extra source of meat, and as a food reserve to be eaten in famine times.

The Transition Between Archaic and Woodland Times

About three thousand years ago, drastic changes in Indian ways of life occurred in all parts of the East. During this Transitional Period in Pennsylvania, Indians lived mostly upon the rivers, apparently taking up an intensive canoe-life. They made very distinctive tools which can scarcely be mistaken for those of any other age. Flint spearpoints are of several broad-bladed forms, and only a few other forms of flint knives and scrapers were used. These are the earliest sites in which large numbers of notched-pebble net sinkers are found, suggesting the first general use of fishing nets. Almost none of the stone tool shapes of earlier times were

still in use. Grooved axes were no longer made, but flat adze blades of granite were apparently used in making dug-out canoes. For the first time in America, cooking vessels were in use. These were not made of pottery, but were carved from blocks of soapstone; broken pieces of the soapstone kettles are found in abundance on larger sites of the Transitional Period. The kettles were rectangular, box-like vessels with flat bottoms and a lug or handle at each end. Pieces from broken kettles were cut into beads and were made into weights for the spearthrower. These weights are rectangular slabs of stone with two or four holes drilled through them, or four notches sawed into the edges, and were lashed to a flat wooden spearthrower, instead of having a shaft hole for a round rod as did the earlier bannerstone. The sites of this age are almost always on the shore of a large stream, and are usually littered with flint chips which are thinner and larger than those of any other times, with net-sinkers made by knocking notches into the ends of a pebble, and often with broken pieces of soapstone kettles. Canoe-anchors (large notched boulders) and boulders with cup-shaped holes worked all over their surfaces are also found on these sites. The soapstone was quarried from an outcrop near Christiana, Lancaster County, and most of the flint used in the Susquehanna Valley during this period came from Caledonia, Franklin County.

Farmers of the Woodland Epoch

During the Transitional Period, our Indians apparently gave up Archaic hunting patterns, in which men cruised the hills and countryside on foot, and they began to follow the rivers for fish, migratory wildfowl, and river-front game. In all later times they continued to inhabit the river valleys, rarely settling away from main streams and making only hunting-trips into the back-country. Men of Transitional times depended upon their canoes to carry cumbersome household goods, kettles, nets, and flint supplies over vast distances. Men of Archaic and Paleo-Indian times could not carry such bulky paraphernalia, and traveled with only axe, clothing, and hunting tools. None of these peoples seem to have ever built houses or tarried long in one place. Almost three thousand years ago, however, farming began, and even in its first stages agriculture seems to have completely modified Indian life. It made sedentary life possible, it led to house-building and town-growth, and made possible much larger populations by lessening the frequency and intensity of starvation. We know very little yet of the early stages of agriculture in the East, but have enough information to outline the growing importance of farming, the introduction of new and improved crop plants, and the constantly increasing effects of farming on everyday life.

Indian agriculture was axe and hoe farming. Mature, full-grown hardwood forest, especially walnut and hickory on the river flats, was cleared with the axe, and yielded fertile, weed-free fields. All cultivation was by scraping with the hoe, and crops were planted in hills as we sometimes plant corn, not broadcast or rowed. Houses and storage structures were built adjacent to the fields, and gardens became the focus of settlement, the place where the hunter lived even though he might travel more than a hundred miles a week in pursuit of game. Farming was entirely the affair of women, probably because women had first discovered and developed crop plants, and field-grown foods quickly became the staples and dietary main-stays of the community.

. . . To Be Continued

Wildlife Grows on Good Soil

THERE'S a man out in Ohio who spends a large part of his time lecturing on conservation. He uses a lot of tricks to attract and hold the attention of his audiences and one of the best is this: He holds up a twenty dollar bill, and offers it to anyone who can name something that a person uses everyday that did not come from soil or that was manufactured without the use of water. He's been using that trick for more than ten years. He still has his twenty dollar bill.

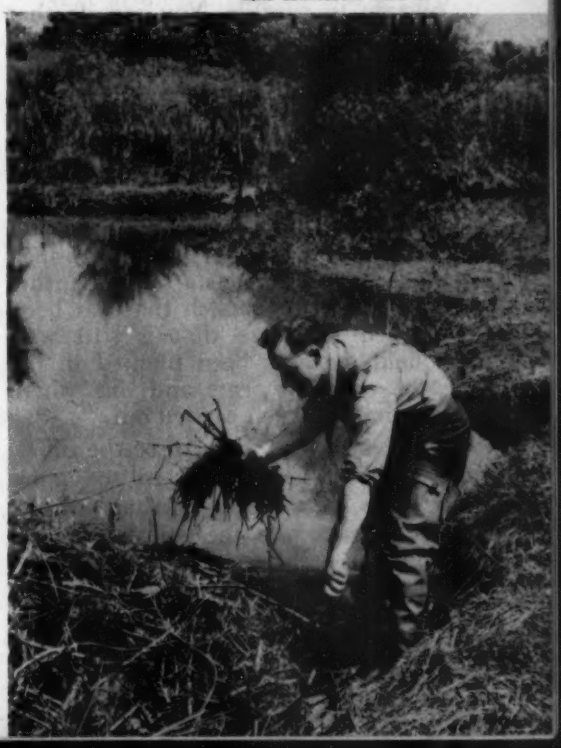
Next he asks his audience to name some item of food that does not come directly or indirectly from the soil or water. Before he finishes, everyone has to admit that soil and water are very important. From soil come plants that provide us with vegetables, bread, cereal and other foods. From soil we get cotton and other fibers for clothing. Trees grow in soil, and we all know how important they are. Grasses and forage plants that feed the animals from which we get milk, meat and leather also grow in the soil.

In the same way that we are dependent upon soil and the plant life it supports, so are wild animals. Try making a list of the animals that are fun to hunt, that eat plant life. You'll find that rabbits, squirrels, deer, pheasants and quail eat plants or plant products. One of our most valuable fur-bearers, the beaver, is a vegetarian, and another, the muskrat lives mainly on plants. Other animals depend for food on animals that eat plant life. Mink, foxes, skunks and bobcats eat smaller animals that live on plants. Even trout, bass, walleyes and pike are dependent indirectly on plants for the base of their food chain.

Animals need plants too for shelter or nesting. Rabbits hide or make their homes in a cat brier tangle or

A beaver house shows the amount of vegetation required to support this valuable furbearer.

Hal Harrison Photo



other brushy spot. Squirrels nest high in an oak or hickory. Beavers build houses out of aspen boughs and muskrats build houses from cattails or reeds. Pheasants nest in high grass or in a shrubby fencerow and grouse make their homes back in the denser woods. Deer may hide in a dense grove of spruces or hemlocks or in a heavy growth of rhododendron. Song birds nest in dead leaves on the ground and at almost all altitudes up to the top of an elm. Even fish use tree roots or weed beds for shelters, and some even lay their eggs on underwater plants.

The basis then for animal life is the soil. If the soil is rich and fertile, plant life will be more luxuriant. The better the plant life grows, the more attractive the area will be for wildlife. Since we're all interested in wildlife for one reason or another, we should be interested in soil and soil management. Obviously the best way to be sure that we'll have a good supply of wildlife is to be sure that our soils produce plants animals need.

The first thing to do is to convince yourself that soil and plants are important to wildlife. You can do that by taking a hike out in the country, around a farm or even just on the edge of town. Try to find examples of these contrasting areas: a grazed woodlot and an ungrazed woodlot; a burned over area and an area nearby that hasn't been burned; an eroded field or hillside and one that has good plant cover on it; a strip-cropped field and one that is a solid planting of row crops; a marsh that has been drained and one that is still wet; a field that has been planted in the same crop for years and one where rotation has been carried out.

It won't take long to see the difference. You are bound to see more animals, or more signs of animals in the areas where the soil is in good condition and producing a healthy growth of plants. Perhaps the animals themselves may not be evident, but look for tracks, bird nests, runways in grass or weeds, signs of feeding such as seed shells or acorn shells in a pile. Look for droppings too. All these indicate that animals use the area.

The next thing to do if possible, is to visit a game management area or private or state game refuge with the manager or conservation technician. Find out what is being done to make the area better for game birds and mammals. How is the soil managed so that it produces plants for food and cover? What else is done to make the area produce more animals?

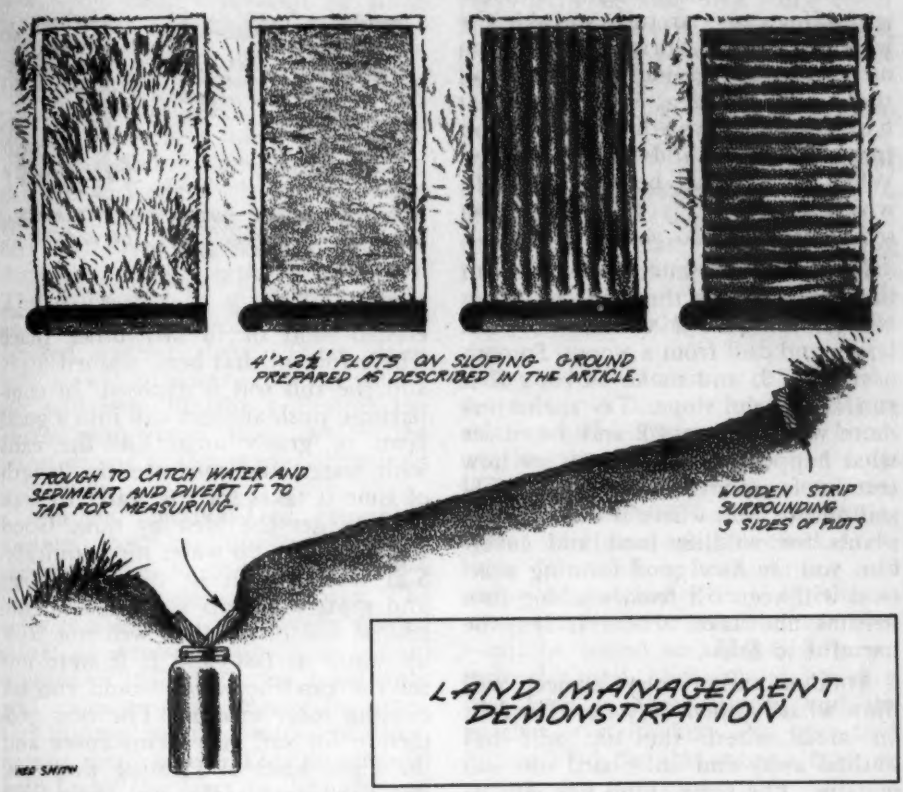
How Soil Is Destroyed

One way in which soil is destroyed as far as its productivity is concerned is through poor farming practices—practices that remove plant cover during the rainy or the windy time of year so that soil washes or blows away. Another thing that causes soil erosion is plowing up and down the hill. You can see for yourself exactly how it happens with a rather simple experiment that you can carry out in your yard or any other open area where there is a slight slope.

First you'll need some string and sixteen short stakes. Stake off four areas each 4 feet long and 2½ feet wide on the slope with the 4 foot sides running up and down hill. The areas should be side by side, with the same degree of slope but with about twelve inches between them. After you have driven in the stakes to mark the corners of each area, connect the stakes with string so you have four rectangles staked out.

Next dig narrow trenches three or four inches deep and an inch or two wide along the up hill end and the two sides of each area. Use the string as a guide. Cut some old boards or lath the right length and place them in the trenches around the four areas.

On the downhill end of each area, dig out space the width of the area,


4'x 2½' PLOTS ON SLOPING GROUND PREPARED AS DESCRIBED IN THE ARTICLE.
TROUGH TO CATCH WATER AND SEDIMENT AND DIVERT IT TO JAR FOR MEASURING.
WOODEN STRIP SURROUNDING 3 SIDES OF PLOTS
LAND MANAGEMENT DEMONSTRATION
NED SMITH

five inches deep and four inches wide. Make a V-shaped trough of boards in this trench so that the top of the V is three inches or so below ground level and so that the trough fits tightly against the sides of the trench. The trough should slant downward slightly across the hill. At the lower end of the trough in each of the four areas dig out a hole and sink a jar or can in the ground so that water running out of the trough will run into the can or jar.

Now mark the areas with numbers —1, 2, 3, 4. Number 1 is completed. Leave it the way it is. But carefully remove any sod from areas 2, 3, and 4. When the sod is removed, area number 2 is completed. With a trowel, garden fork or shovel carefully soften up the soil in areas 3 and 4 to a depth of three or four inches.

Next assume that area 3 is a corn field that you are going to plow up and down hill. Use a stick, the trowel, or a large spoon and make furrows about four inches apart and an inch or two deep running up and down the slope.

In area 4 assume that you are a farmer who has signed as a cooperator in his Soil Conservation District and knows about the right way to plow. Make furrows across the slope—at right angles to it. The furrows should be an inch or two deep and four inches apart.

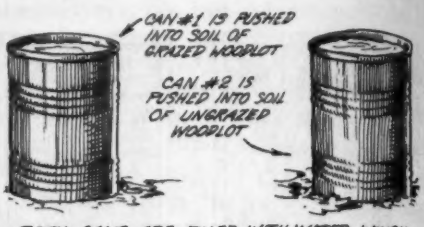
Now comes the easy part of the project. Wait for rain. If you are in the middle of drought and it doesn't look like it will ever rain again—and you want to finish the project qiuckly, get a five gallon pail of water, a sprinkling can and a one gallon measuring can.

Pour one gallon of water into the sprinkling can. Carefully sprinkle the water on area 1. Sprinkle one gallon on area 2; one gallon on area 3 and the same on area 4. Watch what happens. Remove the jars or can from the holes and examine them. What is in the jar besides water? In which container is there the most sediment? Why do you suppose?

Pour out the water and rinse out the jars. Replace them in the holes. Now cover area 2 with some dead leaves and duff from a woods. Smooth over area 3, and make furrows that run across the slope. Try sprinkling more water on areas 2 and 3 and see what happens now. Can you see how certain farming practices will hold soil on the land where it can produce plants for wildlife food and cover? Can you see how good farming practices will keep silt from washing into streams and lakes where it may be harmful to fish?

Another rather easy project will show what happens to water that falls on areas where the top soil has washed away and only hard sub soil remains. The same thing happens in a woods where cattle have grazed, or too many deer have browsed, and the soil has been stripped of plant cover on one hand and become impacted by the animals' hooves on the other. The same thing happens in your school yard or ball field where the grass has been worn away or on your favorite campsite where some fellow has swept all the leaves and duff away so the camp looks like the park in town.

Cut the top and bottom from two or three ½ gallon tin cans or from #5 cans—the size that fruit juice come in. Push one of the cans an inch or so into the hard, impacted soil of a grazed woodlot; push another can into the soft, springy soil of an ungrazed woods. Fill the cans with water and watch them. Use your watch to see how long it takes for the water to soak into the ground.



BOTH CANS ARE FILLED WITH WATER. WHICH WILL BE EMPTIED FIRST BY THE WATER SOAKING INTO THE GROUND?

Try the same experiment in an eroded field or in any other place where top soil has been washed away and the sub soil is exposed. In comparison, push another can into a good lawn or grassy area. Fill the cans with water and measure the length of time it takes for the water to soak in. You get the idea by now. Good top soil soaks up water more quickly. Soil that is rich in decayed leaves and grass soaks up water. Hard, impacted soil or sub soil will not soak up water as fast—and if it were not for the can the water would run off causing more erosion. The best protection for soil is a plant cover and the right kind of farming practices. Protected soil soaks up water and does not wash away. Rich soil that soaks up water grows better plants, plants that provide homes and food for wildlife.

It seems obvious that an important way to help wildlife is to protect wooded areas and ponds and marshes from grazing animals. The best way to do this is build a fence around the pasture to keep the cattle in—or around the woodlot and pond to keep the animals out. Wire fences can be used, or better for wildlife, is a "living fence." This is not the time of year to plant such shrubs as multiflora rose bushes that grow into a strong, stock proof fence if planted correctly. Spring is the best time for planting. Even small areas—one quarter to one half acre plots of suitable food and cover, will provide "islands" for wildlife if they are protected from grazing animals.

Another thing that can be done now is to look for signs of erosion—either small gullies that are just getting started, or places where the plant cover has been destroyed and where erosion may start.

Small eroded gullies may be checked very effectively by building a series of dams—from several feet to fifty feet apart depending upon the slope—along the length of the gulley. The dams may be made from rocks and brush; or poles with brush stocked against them. These dams will slow up water and eventually silt will help fill the gulley, if the surrounding land from which the water drains is also managed to hold back water.

Another method of stopping erosion that has not reached the serious stage is to plant grass or other cover crops on the eroding area. The sides of small gullies may be graded —that is smoothed down—and then planted. Until the grass takes root and starts to grow it may be necessary to cover it with a mulch of straw, hay or small brush. This mulch will help break the force of the rain and keep it from washing the seeds away.

Larger gullies and severe erosion will require the work of experts—and you would do well to report any serious erosion to your Soil Conservation Service District Conservationist.

Grasses of several kinds may be planted now on acres where erosion may occur because the plant cover has been destroyed. Some of the grasses not only prevent erosion, but they also provide food for wildlife.

There may be an Izaak Walton League Chapter in your area whose Johnny Grass Seed program would interest you. League members in many places package seeds in small envelopes, and carry them on fishing trips or hiking and camping expeditions. They plant the seeds in any suitable places they find along the way.

If you live on a farm, or spend the summer on a farm, or have friends or relatives who operate farms, here's another stunt that helps w dlife. When the haying is done, or ops such as oats, wheat, barley corn, bi ckwheat or clover are harvested, leave some for wildlife food. A few odd strips of patches here and there—along the fence, in corners, near trees —will be useful to wildlife later on as food. Quail, pheasants and rabbits find food in these places, and the patches or strips may also provide a hiding place for the animals from an enemy.

There are lots of ways in which you can help game birds and other animals. One very good way is by helping prevent erosion and by building up the soil that grows the plants that animals use for food and shelter. What you do now is really insurance for your own future sport.

We Really Are Nice People

The chances are good that a man who buys a hunting and fishing license intends to spend his time out-of-doors. This is borne out by the findings of J. T. Jones, former jailer in Knox County, Tennessee, who checked the personal effects of more than 20,000 persons committed to the prison, the Wildlife Management Institute reports. Jones, a sportsman himself, found that more than 98 per cent of the persons in trouble with the law had neither a fishing nor a hunting license.

CONSERVATION NEWS

Tom L. McDowell Named Northcentral Commissioner

Governor John S. Fine has appointed Tom L. McDowell, of Bradford, McKean County, to membership on the Pennsylvania Game Commission. The appointment took effect May 19th.

The appointee, born in Bradford in 1911, attended local public schools and was graduated from the Wharton School of Finance and Commerce of the University of Pennsylvania in 1933 and the Law School of the University of 1936. The new commissioner is a member of the American, Pennsylvania and McKean County Bar Associations. In addition to the practice of law, in partnership with his brother, Mr. McDowell has numerous business interests in the Bradford area. Fraternal affiliations include Bradford Lodge, No. 749 F. & A. M., Coudersport Consistory, Zem Zem Shrine Temple, Elks and Moose. He is a member of the First Methodist Church of Bradford, serving as a trustee and member of the official board. He is also a trustee of the Bradford YWCA and a director of the YMCA.

The new commissioner is an ardent hunter and fisherman. He is married and has two sons. Along with his outdoor knowledge and interests in sportsmen's affairs, Mr. McDowell's legal and business background mark him as a splendid choice to the wildlife authority. He fills the Commission vacancy created by the resignation of Joseph P. Wilson, Smethport, now serving as a federal judge. The appointment of the new member brings the eight-man Game Commission to full strength.

Tom L. McDowell

SPECIAL FOX HUNTING PETITIONS FILED

The season for training dogs on wild birds and animals closed March 31, 1954. Such training will not again be permitted until August 1 of this year.

But, under the provisions of the law, the Game Commission shall permit fox hunting with dogs throughout the year, except the 60-day period between April 1 and May 30, 1954, in any county that submits a petition signed by 250 or more of its residents who held hunting licenses last year or who are farmers or sheep raisers.

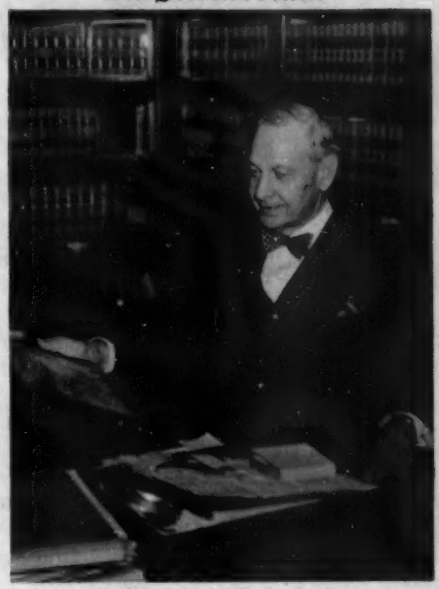
Special fox hunting petitions for this year have been filed, in compliance with Game Law requirements, by the following counties: Blair, Erie, Fayette, Greene, Indiana, Lancaster, Northampton, Schuylkill, Susquehanna, Venango, Washington, and Westmoreland.

Pennsylvanian Elected President Of American Conservation Information Association

Leo A. Luttringer, Jr., Chief of the Pennsylvania Game Commission's Division of Conservation Education, has been elected president of the American Association of Conservation Information. The high honor was accorded the veteran staff officer and former editor of GAME NEWS at the Association's 15th Anniversary meeting held at Monterey, California in early May. Luttringer was one of the original founders of the organization and has served as secretary as well as on numerous committees, including chairmanship of this year's important Professional Standards committee. Other officers elected to head the Association for 1954 include vice-president Harry Lutz, of the Kansas Forestry, Fish and Game Commission; and secretary-treasurer Ed F. Dolder, Chief of Conservation Education for the California Department of Natural Resources.

The Association is composed of various representatives of 49 government conservation organizations in 41 states and two Canadian provinces. As a highlight of their 1954 meeting, the Association made national awards to individuals and groups who made important contributions to conservation education during the past year. Award winners included: Ducks Unlimited for their motion picture on the Canada Goose; Mike Hudoba for journalism in connection with his articles in *Sports Afield* magazine; R. W. Trippensee for his book on wildlife management; William Voigt, of the Izaak Walton League, for his efforts in behalf of youth education; and the National Broadcasting Company for the best national history TV program.

In Memoriam



Judge Grover C. Ladner

Grover C. Ladner, former state Supreme Court justice and one of the Commonwealth's leading conservationists died May 26 in Philadelphia following a long illness. He was 69.

A native of Philadelphia and a lawyer since 1906, Judge Ladner was on the bench of the Philadelphia Orphans Court from 1937 until July, 1950 when he was appointed to the Supreme Court by former Governor James Duff. After leaving the court he devoted most of his time to fighting for many conservation causes and to practicing law. For many years he was a leader in the Pennsylvania Division, Izaac Walton League of American and served as president and director of the Pennsylvania Federation of Sportsmen's Clubs. He was particularly interested in the Clean Streams Program.

Judge Ladner was not only an able, brilliant champion of justice—he was an outstanding champion of many conservation causes. Pennsylvania has lost a fine public servant and a true conservationist.

Choosing The Hot Shot

By Ed Shearer

THE growth of our modern version of varmint shooting can be traced to the birth of our first 22 caliber hot shot, the 22 Hornet. This brain child of Captains Wotkins and Woody—*et al*—coupled to the fact that automobiles began to fall within the price range of Mr. Average Man, sparked the way for today's legion of varmint hunters. Arms manufacturers, gunsmiths and a whale of a lot who were gunsmiths by proxy, eyed this lucrative source of revenue and jumped on the band wagon.

In the following years shooters were treated to a veritable barrage of wildcat cartridges based on various cartridge cases or just plain imagination. To add to the confusion, each gunsmith seemed to have his own ideas on chamber measurements, even for the same cartridge. Out of this mess has emerged today a number of super-accurate 22 caliber cartridges which are referred to as hot shots.

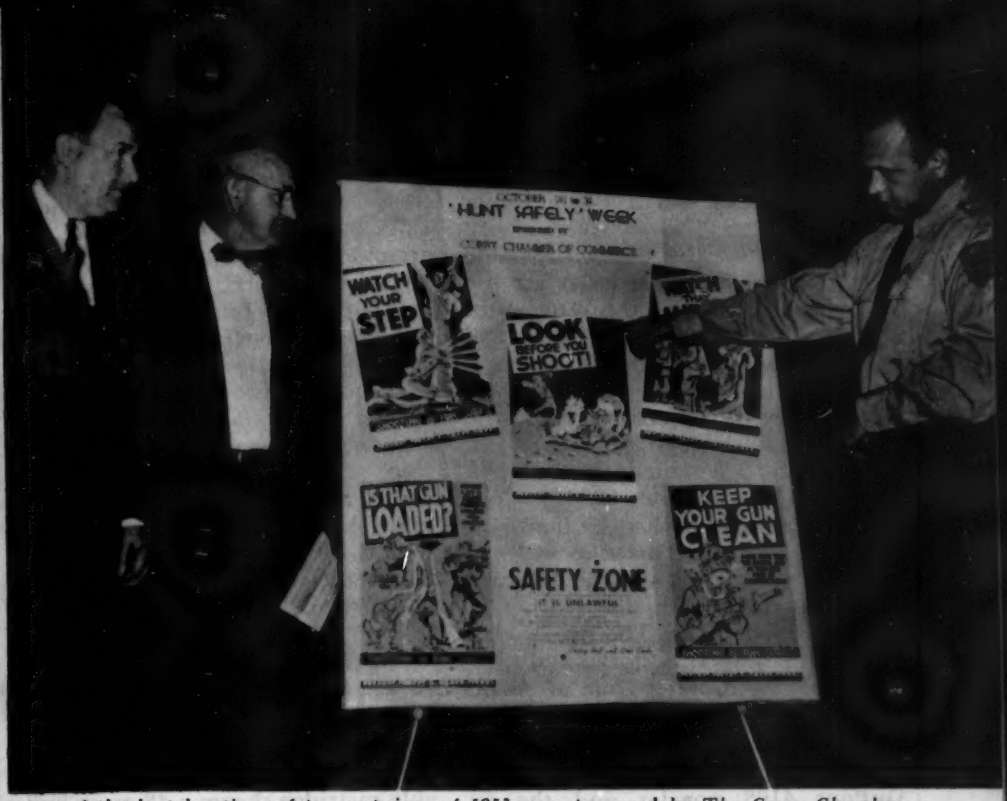
There are two classes of hot shots that concern the varmint hunter. One is the factory hot shot meaning that the rifle and ammunition can be bought across the counter. The other is the wildcat in which the rifle must be made up by a custom gunsmith on some action to suit the customer. The ammunition is not made commercially and must be hand-loaded.

Chamber and cartridge measurements are, of course, well standardized on the factory products. The reputable custom gunsmiths have gotten together and pretty well standardized the wildcats. They all have one thing in common. In a good rifle, properly loaded and with good bullets, they will shoot the whiskers off a woodchuck at unbelievably long ranges.

The modern varmint hunter is the best precision GAME shot since the days of the old buffalo hide hunters. It's bullseye's or nothing with pinwheels on small targets most of the time. But never before has such super accurate equipment been available at a price the average hunter could afford. Looking over the field of hot shots and telescope sights, the newcomer is often uncertain as to which to buy. This choice depends on what the hunter wants the outfit to do.

A combination that would be fine for whacking a chuck's ears off at 150 yards could be a poor bet at 250 yards. If you yearn to bust a chuck across a "coup'la" townships, it's going to cost you plenty of folding money. Ambition always comes high. There are two basic rules for the newcomer. Stick to factory hot shots for which you can buy both cases and ammunition over the counter. Then figure the cost of a telescope sight along with the rifle. How much this will cost depends on the range of the rifle. The longer the range, the better scope you will need and the more it will cost. A hot shot without a scope is no better than any other rifle, with metallic sights. Having reloaded for and hunted with all the factory hot shots on the market today, here is how they stacked up for me.

I first used the 22 Hornet when Winchester started making factory ammunition for it. The rifle was a Sedgely custom built with a Winchester 5-A target scope mounted on it. I was in the Forest Service at the



One of the best hunting safety campaigns of 1953 was sponsored by The Corry Chamber of Commerce. Here F. Bettes, Chamber secretary; Howard Sheen, Corry high school principal; and Bob Parlaman, Game Commission Conservation Education Assistant, study safety codes for hunters. The high school assembly program opened the campaign on October 26th. Other methods used included extensive newspaper publicity, radio broadcasts, and movies.

time and always had this rifle and later, a Savage 19 H, in the car. Both of these rifles were deadly on varmints up to 150 yards. Sighted in to put the bullet 1 inch high at 100 yards they both shot about 1 inch low at 150 yards. On a dead still day you could stretch it out to 200 yards on chuck sized targets and still get a respectable percentage of hits.

I soon found that the little 45 grain bullet at 2600 ft. sec. velocity became wind happy at over 150 yards in the slightest breeze one encounters on most days. I read a lot of criticism at that time about the daily shift of impact with the Hornet. I did a lot of shooting at the time on a 100 yard range well protected in a deep cut. My records showed that both rifles with a clean cold barrel would throw the first shot about two minutes out and then come right back in the normal group, day in and out. However a perfectly sighted-in Hornet will shift its impact, especially at 100 yards or over, in a 5 mile wind which is seldom noticed by the average hunter.

With factory ammunition both rifles average about 1½ minutes of angle at 100 yards and close to one minute with the best handloads. The small 45 grain bullet seemed to pack plenty of punch even on porcupines which are usually bigger and tougher than chucks. I found the hollow point bullets gave a high percentage of ricochets and washed them out with no loss in killing power.

In reloading the Hornet a word of caution would be in order. The modern Hornet cases are of much heavier construction which gives

smaller powder capacity. Consequently some old loading tables give dangerous pressures. While a large number of factory rifles have been chambered for the Hornet in the past, the ones available today are the Savage model 342 and the Winchester in the models 43 and 70. With a 4 power scope this cartridge makes a fine combination in settled districts where noise is objectional and the shooting seldom goes over 150 yards.

The 218 Bee which shoves a 46 grain bullet along at 2860 ft. sec. velocity can also be had in the Winchester Model 43. This rifle had a 4 power Weaver scope and the accuracy ran about the same as the Hornet in the same model rifle. The Bee gives a slightly flatter trajectory and the cartridge case is better from a reloading standpoint.

One of the best hand loads I found for this cartridge was 14.5 grains of DuPont 4198 powder and the 50 grain Sierra bullet. This load gave about 2800 ft. sec. velocity and had better wind bucking ability than the factory load. All things considered the Bee is so close to the Hornet in practical hunting performance that the same conclusions can be drawn for both. They make fine outfits in settled farming districts and can be bought for a modest price.

When Remington brought out their 222 adapted for use in the Remington short action model 722, it caught on like wild fire. This is not based on another cartridge but is an entirely new design by Remington engineers. It drives a 50 grain bullet at 3200 ft. sec. velocity. It is the one factory hot shot that can hold its own with the 220 Swift which has long been considered the most accurate factory rifle made.

The 222 cartridge has made quite a reputation with bench rest shooters, breaking one world's record and making many wins. This is also a very flexible cartridge seeming to do well with almost any load you put in it. In my rifle 21 grains of DuPont 4198 shoves a 55 grain bullet along at 3100 ft. sec. instrumental velocity which is close to factory muzzle velocity. The accuracy is less than a minute of angle. With this load sighted center at 200 yards, 16 grains of DuPont 4227 and a 50 grain Sierra bullet is right on the button at 100 yards. This is a good turkey load giving 2600 ft. sec. velocity and minute of angle accuracy. I have shot the 222 a lot since it came out on various varmints and with hand loads using the 55 grain bullet have found it reliable to 250 yards, under good conditions. It has plenty of killing power and a mild report. It takes a good scope of at least 6 power to get the best out of it. The 222 may be had in the Savage 342, the Sako and Remington 722 rifles.

The Ace of the factory hot shots is the famous 220 Swift. This remarkable cartridge shoves a 48 grain bullet at the terrific velocity of 4140 ft. sec. velocity. The accuracy in any good rifle with hand loads will average a minute of angle or less. The trajectory of this speedster is so flat that with the rifle sighted on the nose at 250 yards, at 150 yards the bullet rises only 2 inches and at 300 yards it is 2 inches below the line of sight.

This is the outfit for the expert who likes to shoot varmints way out yonder, and is willing to pay important money for it. To get full performance out of the Swift calls for a fine scope of at least 10 power with large objective lens that have large resolving power. The X hairs or dot should not cover more than a minute of angle. Less if you can see them as your targets will not be moving.

In hand loading the Swift factory ballistics should not be attempted as factory pressures may run to a maximum of 55000 pounds pressure. This gives short case life as well as barrel life and plenty of other troubles. The best accuracy is found in the 3600 to 3800 ft. sec. velocity bracket, with

Photo by Henry M. Blatner

Right on the line—and you've got to look close! Rigid safety rules must be followed on the range.

pressures easy on the cases and barrel.

My favorite hand load for the Swift is 43 grains of DuPont 4350 powder behind a 55 grain bullet. This load gives close to 3700 ft. sec. velocity and pressure of 46000 pounds. The accuracy is tack hole. I have killed chucks out to 400 yards and is a good wind bucker. With the Swift it can be said that it is as good as the scope you put on it. The Winchester Model 70 is the only domestic rifle made for this cartridge. The draw backs are the loud report and the price. The one bugaboo with all hot shots is wind. On most days you will find yourself running out of wind size before group size on varmints.

So it looks like this on factory hot shots. The hunter who haunts the settled districts and is somewhat of a stalker will find the Hornet or the Bee with a 4 power scope both satisfactory and least expensive. If you want 250 yard range it's the 222 Remington cartridge with at least a 6 power scope, and it will cost more money. If you go all out, it's the Swift with at least a big 10 power scope and costs plenty of the long green. It's where you want to shoot and how far. Either way, "Once a varmint hunter, you'll always be a VARMINT HUNTER."

. . . *The End*

WATCH OUT FOR WILDLIFE ON THE HIGHWAYS

Be extra careful when driving in deer country at night. Collision with a deer may wreck your automobile and injure you or your passengers. Deer, blinded by your headlights, will sometimes leap directly into the path of your automobile—or even into the machine itself. The darker the night, the more danger. Deer are fast on their feet. A touch on your brake pedal, a flick of your light switch and a touch of the horn will usually save them and your automobile and you.

Beginner's Equipment

By Tom Forbes

THE sport of archery has gained such momentum in the past few years that the facilities of the old line manufacturers have been strained to the limit to cope with the unprecedented demand for equipment during certain seasons. New companies are entering the field in increasing numbers and such a wide variety of equipment is offered for sale that the old-timer as well as the beginner is confused by the variety of equipment and the conflicting claims made by the manufacturers and dealers in archery equipment.

The situation is complicated further by the failure of the manufacturers to adopt industry-wide standards against which the various products could be measured and compared.

A little over a decade has passed since the choice of bow materials was limited to such woods as yew, osage orange, hickory, and lemonwood, and arrows were generally made from birch or Port Orford cedar. From these few possibilities it was not too difficult for an archer to choose a bow and arrows. The quality of the materials and workmanship could be judged fairly well by the individual and a purchase made within a price range suitable to the archer's pocketbook. Bows, with certain exceptions were all purpose bows and no thought was given to acquiring a bow or arrows for one special type of shooting.

In fact bows were of such simple construction that many archers, familiar with wood working tools enjoyed making their own equipment. To a small extent this practice continues to this day. Some manufacturers cater to this group by providing partially finished bow kits which permit the archer to do a good portion of the work necessary to build a bow. A number of archers still prefer to make their own arrows. Due to the wide range of materials used in the manufacture of bows and arrows today and the admitted superiority of the modern bow made from these materials few experienced archers attempt to make their own bows and rely instead on the manufactured product.

Although archery equipment has moved out of the toy section of your sporting goods store and occupies a prominent place along with the array of sporting arms, few are the salesmen who have any knowledge of the sport of archery or who have attempted to learn to use the weapon. Frequently the salesman of firearms has a thorough working knowledge of the weapons he has for sale. The bow as a hunting weapon, however, has but recently attained prominence. Most retailers have failed to keep pace with the demand for information on tackle and equipment. If your sporting good store has an archer in its employ, you are indeed fortunate. He can give you valuable advice on the selection of your first equipment.

It is a common experience to see a child equipped with a bow which is beyond his physical power to draw and shoot properly. This unfortunate condition generally stems from lack of knowledge on the part of the parent and of the salesman who sold it to him. Together they have almost

made it certain that the youngster will quickly tire of the sport when his pathetic struggles to master the weapon produce so little in the way of results.

A single example should be enough to convince anyone that advice from an experienced archer should be sought on the purchase of beginner's equipment. Several youngsters were shooting under my supervision at a target erected on my lawn. A ten year old riding by on his bike stopped and asked if he could bring his equipment and shoot. Permission was given and he soon appeared with a bow and arrows. The bow was marked with a drawing weight of forty pounds. It had been a Christmas present along with a dozen expensive footed arrows. The outfit represented a monetary outlay of at least $25.00. Needless to say that the child had had no instruction. His attempts to shoot were pathetic and the drawing weight of his bow precluded giving him even elementary instruction. It is a mistaken idea that the ability of an archer can be measured by the drawing weight of his bow and the prospective purchaser should take particular care to buy a bow that has a drawing weight well within his physical limitations.

The beginner should be able to bring the bow to full draw easily and without undue strain. It is understood that a bow is always shot from the full draw position. Unless the beginner can do this he will not readily be able to acquire correct shooting technique and measured by his lack of success in hitting a selected target he will get little satisfaction from the sport. Since physical prowess varies with each individual no hard and fast limits on drawing weights of bows for beginners can be given.

There are so many kinds of bows on the market today that to compare one with another confounds even the expect archer. In the hands of a qualified archer almost any one of the bows manufactured today can look like a good buy. Every archer, once he has acquired good shooting form, attempts to improve his scores by selecting the bow which he believes best suited to his physical makeup and the purpose for which he intends to use it. For example a bow purchased for use in the hunting field may have a drawing weight of fifty to eighty pounds but the experienced archer will have acquired proper shooting form and developed the muscles used in shooting by use of a lighter weight bow which he uses in competition and to practice marksmanship.

A beginner should not buy expensive and specialized archery tackle and equipment. A light weight medium priced bow and a set of practice arrows, a leather shooting tab and an arm guard are all the equipment needed to learn to shoot the bow. Such a kit may be purchased or made up from individual items for as little as $12.50. After you have mastered shooting technique and can

Young archers should start with the proper equipment and constantly practice if they are to achieve success.

—Hazleton "Plain Speaker" Photo by Phil Sarno

keep your arrows on the target will be time enough to consider the purchase of better equipment.

Whereas a rifle can be expected to give years of satisfactory service, bows have only a limited life and in general carry a guarantee for a year against breakage. Repeated flexing of the fibres of which the bow is constructed results ultimately in fatigue of the material. A bow which is shot or drawn repeatedly "lets down" or "follows the string" in the jargon of the archer, which means that it loses its power to cast or propel an arrow.

The beginner will save money if he goes slowly and does not expect that he can buy a good score by the simple method of acquiring the highest priced bow in the dealer's stock.

Bows that have a drawing weight of fifteen to twenty pounds make suitable starting bows for children and women. Teen-agers would do well to start with a twenty pound bow which will prove sufficiently tiring when shot throughout an afternoon. A number of my adult friends and acquaintances who have become interested in archery have bought twenty-five and in a few cases thirty pound bows with which they have learned to shoot. In no case have they regretted their purchase. It is a fallacy but a common belief that cast or velocity of an arrow increases directly in proportion to the drawing weight of a bow. Nothing could be farther from the facts. After you have learned to shoot, you will also have learned that cast varies from bow to bow and that each manufacturer is striving to produce a bow that has a high velocity or cast and at the same time a low drawing weight. To the extent that they have succeeded, archers are willing to spend considerable sums of money for a particular bow.

Bows of different materials differ also in length. The beginner is primarily concerned with the length of a medium price wood self bow which is a time proved product of the bowyers art and the proper length of arrows which he or she should purchase. To obtain this data measure the distance in inches from finger tip to finger tip of your outspread arms. In the table accompanying this article this distance is called Spread Measurement. The corresponding length of arrow and suggested bow length is now readily determined by inspection from the table.

Nineteen of the successful bow hunters in Pennsylvania last season reported to the Pensylvania Game Commission that they were hunting deer with a bow for the first time.

There is ample time between now and October for the beginner to acquire the ability to use a hunting bow and to gain sufficient confidence in his skill to send him forth in the special archery deer season in search of a buck.

EQUIPMENT TABLE

Spread Measurement	*Arrow Length*	*Suggested Bow Length*
57-59 in.	22-23 in.	Not less than 4 ft., 6 in.
60-62 in.	23-24 in.	
63-65 in.	24-25 in.	Not less than 5 ft., 0 in.
66-68 in.	25-26 in.	
69-71 in.	26-27 in.	Not less than 5 ft., 6 in.
72-74 in.	27-28 in.	
75-77 in.	28-29 in.	Not less than 5 ft., 9 in.
Over 77 in.	30 in.	Not less than 6 ft., 0 in.

. . . *The End*

Early Prospecting Pays

By Larry J. Kopp

BY EARLY prospecting I mean NOW! The trapper who excuses himself from this all important early start with the thought that it is too early, or too warm to prospect during the summer will unknowingly reap only part of the available fur animals in his trapping territory. Hurried and last minute prospecting trips just before the season do not reveal all there is to know about your territory. Many hidden factors which you should know go by unseen, and unexplored.

The trapper will be wise to remember the old saying "practice makes perfect." Applied to trapping it means that the trapper who devotes as much summer spare time as possible to becoming thoroughly familiar with animal movements in every nook and cranny of his territory will be assured of more fur money next trapping season. So, take a tip from the experts and prospect early and often.

By this time our common fur animals, including the skunk, opossum, raccoon, and muskrat have established their homes where they will remain until another spring. Raccoons make their home in hollow trees and in cavities found among rocky ridges. Skunks and opossums resort to old woodchuck holes, but often they make themselves at home under old buildings or under slab piles and similar places. The muskrat on the other hand builds its home in dens dug into stream banks.

Thus, with the family home well established, Mr. and Mrs. furbearer will be busy searching for food and caring for their young. This means, in other words, that where you now find these fur animals you will also be sure to find them next fall. Only rarely will a family of these furbearers leave its home and move into another area before the next spring mating season begins.

How to go about prospecting your trapping territory should not pose any problem since there are no set rules which you must follow. Thorough prospecting of a trapline is largely a matter of hiking and snooping around in the brush being always on the lookout for animal tracks; likely set locations; and "homes" of fur animals.

An exceptionally important point is to always carry along a notebook and pencil to keep notes of important details. In taking notes the first thing is to enter the month and date of your field trip. Next make a note of the weather conditions during the preceding night. Then as you observe anything which might be of help to you next fall continue to takes notes.

For instance when you find tracks of a certain fur bearer, jot down the name of the animal which made the tracks; and the location which is most important. As an example, your note might read like this: May 10—Noted raccoon tracks, traveling upstream, under old chestnut log lying across small run on farmer Brown's farm." The idea is to mention familiar or conspicuous objects at or near the spot which will help you recall the exact location months later.

Since fur animals of all types like to hunt for food along streams and small runs it will pay the trapper to make regular prospecting trips along all such waterways. Each trip will reveal some new fur sign, and later, by checking over field notes the trapper will be able to determine just what species of animals travel along a particular stream; how often a specific animals or species travels the same stream; and he can also determine the most ideal locations for future sets.

Although tracks are the most accurate signs of fur animals, there are other signs which the alert trapper should be on the lookout for. For instance, when the trapper finds a rock along the stream which is covered with numerous fish scales or parts of a fish, he can be almost certain that a raccoon caught a fish nearby, then proceeded to eat it, using the rock as his dinner table.

Shells of freshly opened mussels found along the edge of streams or in shallow water are another indication of the raccoon's presence. Raccoons dig these fresh water mussels out of the mud with their front paws, break them open, then eat the oyster-like mussel inside. Just how a raccoon manages to break open such mussels is still one of those unexplained mysteries, for it is indeed not an easy matter to open them with one's hands.

While it is true that raccoons find much of their food along streams in farm country, the wise trapper can also find similar signs of the animal along small mountain runs where the rocks are all covered with beautiful green moss. Here the trapper may find spots where much moss has been torn from the rocks; many of them recently turned. Here and there one may find small holes dug into the gravel, and these are all signs of the raccoon's nightly search for food. Along these pure little mountain runs the raccoon finds choice bits of food such as crabs and several species of salamanders which are found only among the green moss covered rocks where the hot rays of the sun seldom penetrate.

It pays to make frequent prospecting trips along waterways, looking for fur signs and possible trap sites.

Since muskrats are normally found only along streams, it is not so essential to pay much attention to signs at this time of year since most of it will be changed or obliterated by fall. However, since water levels are usually low during the summer, the trapper has a good opportunity to locate muskrat dens and make a note of their location.

During the course of such prospecting trips along waterways, the alert trapper is constantly watching for good natural set locations. Such places where an obstruction along the stream forces an animal to enter the water in order to get around it should always be noted in one's notebook. Other natural set locations may be formed by roots at the base of a tree. Frequently one will find fairly large V shaped openings which are just right for a productive raccoon or skunk set.

Natural passageways formed by

rocks along the stream; or hollow logs near the stream provide still more natural set locations.

Skunks and opossums also hunt for food along overhanging and grassy stream banks. But the best place to look for skunk signs is in grassy fields or corn fields. Here they spend many hours during the night searching for mice and insects. Freshly turned stones and numerous small holes dug in the ground are unmistakable signs of this popular fur bearer.

A diligent check of all old woodchuck dens along nearby fencerows or abandoned farm fields will in all probability uncovers a family of skunks. Sometimes such a skunk den can be detected by a skunky odor exuding from the entrance. Other evidence might be skunk droppings near the den; or perhaps a real close examination would reveal long black hairs clinging to the sides of the den.

Frequently skunks display a little more cunning than what they are usually credited with by actually depositing their dung some distance away from the den where it is hidden from the casual observer. I have accidentally located families of skunks when I found numerous skunk droppings at the base of a large tree. From this sign I knew that a skunk den must be nearby, and usually I found it from ten to twenty feet away from the tree. This is just one of the many interesting facts which the serious trapline prospector gets to learn. This means that when the trapper locates a likely looking skunk den, but with no apparent signs in evidence, he should make a search of the immediate surroundings for a distance of approximately twenty-five feet. Very likely a concentration of skunk droppings some distance away will provide proof that the den is occupied by skunks.

The opossum's feeding habits differ from the other animals under discussion in that he does not leave any particular signs which indicate his presence. However he eats all of the food items which wild animals are known to eat. In other words he eats almost anything, but seems to prefer that which is most easily obtained. Like the gray fox, 'possums are fond of rotten apples, grapes, and persimmons.

Since raccoons and skunks also are fond of grapes it is important that the observant prospector keep his eyes open for grapevines. When grapevines, including both the fox grape and the frost grape, are found, a note of their location should be made. When early fall arrives, these fur bearers will make regular visits to feed on the juicy ripe grapes.

I have purposely avoided mentioning the importance of building trap sites and other preparatory trapline work during the summer months because that can be done much better during the early fall. It is then that a thorough study of your summer field notes will help you select the best places for trapsites. . . . *The End*

Things You May Not Know

Honey bees carry water as well as honey. Special carriers bring it to the hive, dole it out, seal it in cells, or even act as storage tanks themselves until the water is needed.

• • •

The fact that the blood in their gills flows in one direction and the water in another enables fish to utilize the oxygen in water most efficiently.

• • •

New Guinea's Greater bird of paradise, noted for its magnificent and multicolored plumes, is a cousin to the common crow.

• • •

The wings of a butterfly are made up of scales similar to those on a fish.

• • •

The falcon has a sharp tooth and notch on its beak which enables the bird to cut its meat with a swift stroke instead of tearing it.

• • •

Summer Suggestions

By Herbert Kendrick

IT IS not difficult to persuade gunners to care for hunting dogs when the open seasons are announced, and trips afield are planned. However, when the seasons have closed, and our thoughts turn to fishing, far too often, I fear, we forget our dogs during the trying period of hot summer months. A little care and attention would make their summer life more pleasant and healthy, thus making them far more valuable animals when another hunting season opens.

A well-bred gun dog is a valuable asset and should certainly be well cared for every day of his life.

With the arrival of hot unpleasant days comes the usual swarms of insects and parasites to make your dog's life more of a "dog's life." These disease bearing plagues can cause serious sickness if they are allowed to go unchecked.

First of all the dog's house should be cleaned often, whitewashed, and supplied with cedar bedding. Cedar sawdust or shavings are a distinct discouragement to insects. The runways or yards around the dog house should be kept clean at all times thus preventing the breeding of parasites.

If a dog is kept in a double-wired pen, where stray dogs cannot contact your own, the insect problem will be kept to a minimum.

Dust your dogs frequently with a good reliable flea powder. This dusting will kill fleas and lice, while a good spray used wisely and often will prevent flies and mosquitoes from irritating the dog. A word of caution here, however, if your dog has puppies, be very careful to keep the powder and spray from the puppies' noses and the mother's breasts.

The next problem is that of heat for the dog *must* have shade at least during the heat of the day. Of course tree shade is best, but if his quarters cannot be located near trees, then artificial shade in the form of a roof or shelter must be provided for your canine friend.

One of the most important needs of summer is plenty of fresh cool water. A small pipe running from a house spigot down to the dog's water container is a handy way to keep him well supplied with minimum effort. If this arrangement cannot be made, supply each dog with a container that holds at least a gallon of water, and fill it at least twice every day.

An occasional dusting of air-slacked lime will keep the pen from becoming smelly and foul, and the water hose should be used to settle dust during the dry season.

Bathing a dog during the summer months is not as necessary as many believe. If he is powdered, brushed, given proper food, sufficient fresh water, and possesses general good health, his coat will stay glossy and silky. One of the best ways to judge a dog's condition is by the appearance of his hair.

The summer campaign for your dog's well being should surely include exercise. This is a double problem because it is too hot to allow the dog

The April meeting of the Game Commission was held "on the ground" at the new State Game Lands, known as "Devil's Hole", in the Poconos. Seated, left to right: Commissioners Biddle, Herman, Williams, Executive Director Bennett, and Commissioner Buchanan. Standing: Commissioner Long, Staff members Gilford, Minihan, and Heffelfinger.

to run, and our laws prohibit it. Either let him swim at every opportunity, or permit him to run around the yard in the cool of the evening. Keep him on a long check cord if you live dangerously close to highways.

Summer diet for the dog should include more protein, less fats and carbohydrates. Less food will be needed in hot weather than in the cold winter months when he is much more active. First rate prepared foods on the market today greatly simplify our summer feeding problems.

Be certain food is not left in the pan to become spoiled and later eaten with a fresh supply. During the summer it is better to feed twice each day, light in the morning and heavier in the evening. Do not overlook a chance to give him a good bone from the market, because it will help his teeth, and give him something to do during the long warm hours.

For the individuals who have acquired puppies, the evenings of summer months are ideal for yard training. Manners, housebreaking, teaching to whoa, sit, heel, etc., can be handled in warm weather, provided the lessons are not too long.

If the dog is old enough, the rough task of forced retrieving may be completed. Take plenty of time for this course of study, and your dog will be of greater service.

Allow your dog to sit with the family on the porch in the evenings, and take him along for a drive in the automobile when it is convenient. He will deeply appreciate the association with the family, and the change from the kennel yard.

Spend all the time you can with your hunting partner during his "trying period," and he will know and appreciate your friendliness and care, and when the frost comes he will reward you with a superlative performance every time you take him afield.

OUR WILDLIFE LEGACY

By Durward L. Allen

Illustrated with 26 black and white photographs. Published by Funk and Wagnalls Company, 153 East 24th Street, New York 10, N. Y.

422 pages. Price $5.00

This is one of the finest books that has been written about the management of fish and game resources. Its purpose is to give the responsible citizen "an adequate boil-down of wildlife science that is properly related to the conservation (wise use) of other resources. The goal is a sound conservation philosophy from which any intelligent person can factor problems as they arise and reach his own logical decision." In a coherent, readable, and popular style, the author analytically appraises the different species of fish and game, their known capabilities and limitations, their requirements, and their response to various factors. This is a book which should be read and studied by sportsmen, naturalists, professional wildlife workers, outdoors writers; in fact, all groups and individuals who in any manner have anything to do with our renewable natural resources.

WILDLIFE IN ALASKA

By A. Starker Leopold & F. Fraser Darling

Illustrated with maps and photographs. Published by The Ronald Press Company, 15 E. 26th Street, New York 10, N. Y.

129 pages. Price $2.75

Here is a timely report on the status of wildlife in one of the last unspoiled regions of the world—Alaska. Beautifully written by two eminent conservationists, it offers significant recommendations for fostering the development of Alaska's invaluable wildlife resources—especially caribou, moose and reindeer. Sponsored by the Conservation Foundation and the New York Zoological Society, the authors carried out an extensive field study upon which their book is based. With Alaska's economy in mind, they spell out the general ecological problems and indicate the broad approach to planning and research needed for intelligent management of Alaska's living resources. Conservation-minded citizens, legislators, government officials, and sportsmen will find it a valuable and thought-provoking book.

Suggestions

FOR YOUR

Summer Reading

HOMEMADE FISHING

By Verne E. Davison

Illustrated with black and white sketches by Wallace Hughes. Published by The Stackpole Company, Telegraph Press Building, Harrisburg, Pa.

205 pages. Price $4.50

One of the great conservation discoveries of this age has been the correct management of new waters which have been properly constructed to furnish additional fish and improved angling. This book is particularly timely. Thousands of new ponds are under construction, more will be built tomorrow. If you invest in a pond for your land, a copy of Verne Davison's book should be readily at hand. Included in detail is information about warm-water and cold-water ponds—all the way from site selection to how to catch more fish. Other chapters discuss selection of fish species to be stocked, where to get them, fertilization to increase food supply, side streams and ponds for trout, those troublesome waterweeds, and the use of poisons.

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